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SARCOMA OF THE INTRA-ABDOMINAL TESTIS

WITH REPORT OF A CASE *

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This subject has attracted the special attention of a few recent writers in this country, notably Bulkley,[1] Coley,[2] Ewing[3] and Hinman[4] of Johns Hopkins. I am indebted to them for statistical and other interesting data.

Bulkley collects from the literature fifty-seven cases of sarcoma of the intra-abdominal testis; thirty-seven of the fifty-seven patients studied were single cryptorchids. Seventy-five per cent. of all the cases occurred in patients between 25 and 45 years of age, and 74 per cent. of the mortality occurred within one year after operation. The fatal progress was more rapid in the undescended than in the scrotal testis.

Hinman says that the malignancy is relatively more common in the undescended testis and this is the generally accepted view. Bulkley states that one in every four cases of malignant disease of an abnormally located testis is in the abdomen, and that there is one abdominal sarcoma to every fifteen sarcomas in the scrotum. Observations of others vary but little in this respect.

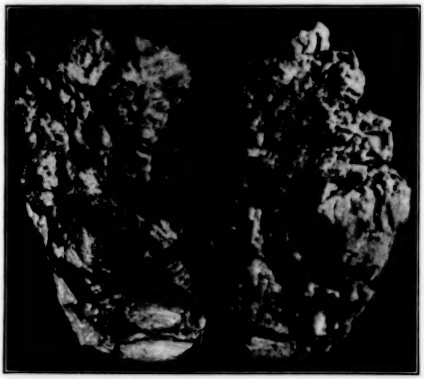

Fig. 1.—Gross appearance of neoplasm, diminished one third since operation.

Ewing states that most testicular neoplasms originate in the sex cells and are primarily teratomas, and others declare that all malignant tumors of the testis are teratomas or derived from them.

The teratomas and mixed types of tumor grow more slowly and in these cases the lymph glands are not involved so early. When the disease is in the right testicle the glands of the vena cava are the first involved in the metastases, and when it is in the left testicle the glands of the aorta are first involved.

Bulkley states that, in the forty-seven intra-abdominal cases in which operation was performed, only three of the patients were known to be living after two years.

Syphilis, tuberculosis and nonmalignant neoplasms of the abdominal testis are practically unknown.

Bulkley expresses the common opinion that spermatogenesis is lacking in the abdominal testis, but this statement admits of some qualification. He also says that transplanting into the scrotum does not improve it in this respect. This refers undoubtedly to the late operation in adult life.

Trauma is more common to the testis in its normal position, but it is not generally regarded as an important factor in the causation of malignant degeneration of the testicle.

Chevassu classifies all teratomas as cancerous.

With these preliminary observations, I desire to contribute one more to the brief list of reported cases of sarcoma of the intra-abdominal testicle.

REPORT OF CASE

The patient, L. W., was a miner, aged 37 years, married. He had never had any venereal disease. When 17 years of age, he had consulted a physician in regard to an undescended testicle on the right side, but nothing important was done, and the man had no discomfort or inconvenience until April, 1913, when moderate discomfort in the lower abdomen with dull pain and stomach indigestion caused him to seek medical aid. He consulted me in November, 1913, and a large abdominal tumor extending above the umbilicus and filling the lower abdomen was readily observed. It seemed to have a fixed point in the pelvis and admitted of but slight motion laterally. More frequent micturition was believed to be due to pressure on the bladder. The urine was normal and cystoscopic examination by Dr. Oliver Lyons showed no pathologic condition of the bladder.

The insidious and finally rapid growth connected with, as I felt, the intra-abdominal testicle impelled a diagnosis of sarcoma of the retained testicle. Its operability I doubted, but an exploration was decided on and, Dec. 6, 1913, at St. Luke's Hospital, assisted by Dr. Lyons, I opened the abdomen by a liberal incision in the middle line. A large,

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Bulkley: Surg., Gynec. and Obst., 1913, xvii, 308.
2. Coley, W. B.: Cancer of Testis, Ann. Surg., July, 1915, lxii, No. 1.
3. Ewing, J.: Teratoma Testis and Its Derivatives, Surg., Gynec. and Obst., March, 1911, xii, 230.
4. Hinman, Frank: The Operative Treatment of Tumors of the Testicle, THE JOURNAL A. M. A., Dec. 5, 1914, p. 2009.

vascular appearing, solid tumor, with few adhesions to omentum or intestines, was apparent. The cornu of the right fundus of the tumor revealed a nodule the size of a hickory nut. The bladder was manifestly pressed downward or partially involved in the growth and could neither be seen nor felt. The hand in the abdomen posterior to the tumor discovered what seemed to be half a dozen nodules or enlarged glands connected with the growth at the base of the bladder. An aspirating needle was inserted into the middle of the tumor, and no fluid was withdrawn. With pressure around the puncture, a little grayish, brainlike substance escaped. Its sarcomatous nature seemed most probable.

The safe removal of the tumor being deemed most improbable, the abdomen was closed. The patient recovered promptly. On the third day, I commenced the use of the erysipelas and *Bacillus prodigiosus* toxin (Coley). I was determined to push it to the limit and to give it a fair and impartial trial. My assistant in the case (an accomplished genito-urinary surgeon) gave the patient a ninety days' lease of life.

The toxin, prepared by Dr. Martha Tracy of Philadelphia (Coley's formula), was administered three times a week. The dose, commencing with half a minim, was increased rapidly until a reaction of from 102 to 103.5 degrees of temperature was produced. At the end of one month, there was hardly a perceptible change in the growth, but certainly there was no increase. In seven weeks there was manifest decrease.

In February, 1914, the patient was given a few ordinary Roentgen-ray treatments by Dr. S. B. Childs. February 23, he left for Redcliff to resume his duties as foreman in a copper mine. I taught his wife and gave her written instructions with regard to the method and technic of giving the toxin. The patient visited me every two or three weeks for report and examination. This treatment was continued steadily with but two brief intermissions for eleven months. A written record was kept of his condition, chill and temperature especially being noted.

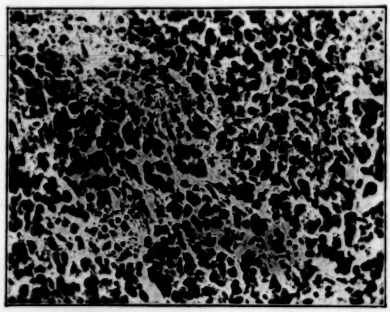

Fig. 2.—Typical sections of tumor showing large round cells and sarcomatous structure; stroma and vessel arrangement well seen. Zeiss apochromatic, 8 mm. Leitz projection ocular (R. C. Whitman).

During this period there was not a single local infection from the injections, which were given chiefly in the loins and gluteal regions. Coley advises that the injection be made preferably in the tumor, but, when the lesion is within the abdomen, it is not safe to do this, unless adhesions to the abdominal wall are evident and sufficient to prevent extravasation and peritonitis.

It seems remarkable that even a naturally vigorous, healthy young man could work with hardly the loss of a day under such conditions, but it was made possible in this way: He went off duty every afternoon at 4 o'clock, and as soon as he reached home his wife, quite an intelligent woman, gave the injection. He immediately went to bed. Usually he had a chill followed promptly by a rise in temperature which not infrequently reached 104 and occasionally a little higher. In two hours the temperature would begin to decline at a rapid rate. He was then given a dose of quinin and liquid food. He slept very well the latter part of the night, and by morning was ready for breakfast and work.

The patient was very susceptible to the influence of the toxin, and during the eleven months, when more than 100 doses were given by injection, the maximum dose was 18 minims. In many reported cases of sarcoma, much larger doses have been administered with impunity in a short period of time. In this case it was continued faithfully and persistently, because the growth was steadily diminishing in size, and I hoped it would reach a point where it could be successfully removed.

In April, 1914, for three weeks, the injections were discontinued that I might observe the effect. I examined the patient at the beginning and at the end of this period and could not fail to observe, as did the patient and his wife, an increase in the size of the growth. The toxin was resumed and the tumor soon decreased in size. In August, 1914, the toxin was again discontinued with the intention of an early operation, the tumor being much smaller. In ten days the tumor was perceptibly larger. The patient came to Denver and I verified the fact. The use of the toxin was immediately resumed with prompt arrest in the increase of the growth.

Sept. 24, 1914, the patient called me over the telephone and stated that one leg was swelling. October 30, he came to Denver. Both legs were finally involved from the groins to the feet. The swelling was not due to phlebitis, but to lateral pressure of the tumor, or inflammatory tissue, on the iliac vessels. The patient was put to bed and his legs were bandaged. I now injected the toxin myself directly into the tumor to the depth of 2 inches, feeling satisfied that adhesions to the anterior abdominal wall rendered it safe. The reaction was much more severe and profound, and I found it necessary to reduce the dose to 50 per cent. of that usually given him. This was an interesting fact, showing a rapid and more extensive distribution of toxins into the system when injected into the tumor, which, in a weakened patient, might prove not only dangerous, but fatal. This method of injection was continued twice a week for five weeks, and during most of this time the patient was confined to bed on account of the weight and discomfort of his legs in walking. The swelling of the legs rapidly disappeared, and the tumor slowly decreased in size.

After Dec. 6, 1914, the patient was sent to the office of Dr. Childs for a series of Roentgen-ray treatments. Thirteen ordinary gas-tube treatments were given in December, 1914, while the Coolidge tube was used in serial treatment one day only in January, 1915.

During the year 1914, the tumor under toxins felt harder and more circumscribed on palpation. The Roentgen ray seemed to have the same effect; it also vastly increases, Dr. Childs states, the inflammatory adhesions connected with growths.

Jan. 30, 1915, with the assistance of Dr. Lyons at St. Luke's Hospital, I removed the growth completely and successfully.

The tumor and immediate surroundings differed in some respects from those observed at the exploratory operation, Dec. 6, 1913. The neoplasm was now quite uniform and regular in outline. The projecting nodular appearance at the fundus had disappeared. The adhesions in front had obliterated the peritoneum. The tumor was surrounded by a thick capsule of fibrous and connective tissue. Adhesions to the colon and omentum were extensive, but there were few to the small intestine. The inferior half of the transverse colon was buried by adhesions in the fundus of the tumor. Its safe dissection without damage to the integrity of the intestine was the most difficult part of the operation. The bladder, though adherent, was not involved in the growth. With the hand beneath the outer capsule, I shelled out the tumor, leaving the iliac vessels, on the right side especially, freely exposed. No lumbar glands were enlarged nor were any discovered about the base of the

bladder. The large cavity left at the base and sides bled quite freely and it was necessary to pack it with gauze for forty-eight hours. It was then removed and a double rubber drain inserted. Necessarily such a wound would heal slowly, and, fortunately, adhesive ileus did not occur during the process.

The tumor was submitted to Dr. R. C. Whitman, pathologist of the University of Colorado, School of Medicine, who made the following report: "I regret to report that the tumor from Mr. Walker is a typical large round-celled sarcoma. It is also sometimes called carcinoma, mesothelioma, and malignant teratoma. This particular one is somewhat interesting in view of the fact that certain portions of it present a typical sarcoma structure, while others have some appearance of the usual carcinoma." This shows a mixed type.

The patient recovered promptly and resumed his position at the mine in five weeks. A fistulous opening, extending to the full depth of the wound, remained for a year. This was attended with an annoying sequel and for a short time excited some apprehension. From the date of operation, January 30, the toxin was continued until June 24. At this time the patient was suffering from local infection of the fistulous tract and a small, deep, unhealed cavity.

Before leaving Denver, I injected bismuth paste to complete the healing. When the patient went to the copper mine, I showed him and his wife how to use it, and it was now the only treatment, injection being repeated two or three times a week, but technic imperfect.

June 24, as indicated, he had a slight rise of temperature with headache. There were local swellings in the abdominal wall and the glands in the groin were slightly enlarged, suggesting metastasis.

I found the old fistulous wound infected, June 26, with a small nozzled syringe, I washed out the paste and pus with a dilute solution of hydrogen peroxid. The temperature was normal in thirty-six hours. The serial Roentgen-ray treatment with Coolidge tube was begun June 29 and discontinued July 5. I continued the irrigation with a 2 per cent. solution of liquor formaldehydi in glycerin for ten days at least. Improvement was continuous and the patient gained 37 pounds in weight in two months, and all local indications of disease disappeared in a short time. He has had no toxin since, and no Roentgen-ray treatments since July 29, 1915.

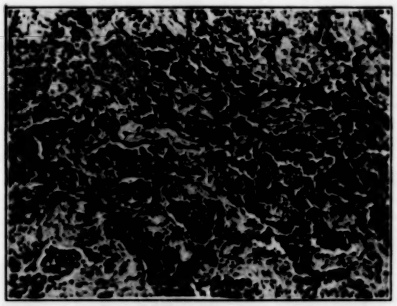

Fig. 3.—Carcinoma-like area, showing cell nests sharply differentiated from the connective tissue stroma. Zeiss apochromatic, 16 mm. Leitz projection ocular (R. C. Whitman).

The improvement of the patient was so prompt and rapid that I felt this temporary setback was due to infection from the small pus cavity chiefly, but I attribute benefit to the use of the Roentgen ray. Its chief use, in my opinion, is after, not before, operation in any operative case.

The superficial veins of the abdomen were conspicuous for a year before operation. Their appearance today is nearly normal and so is the patient's general health.

He is 5 feet, 6½ inches in height, and weighs at this time 175 pounds. June 30, 1915, he weighed 137 pounds and his weight had slowly but steadily increased since the operation, January 30. The frequent use of the toxin with severe reaction, no doubt, operated to prevent rapid increase in weight.

COMMENT

Treatment of this condition is by radical operation, and its success depends chiefly on early recognition. The disease is quite insidious in its early stage, and unfortunately diagnosis is made usually at an advanced stage. Hinman places the operative cures at from 15 to 20 per cent. This is better than formerly recorded.

Prevention is worthy of consideration. This can only mean the transplantation of the organ to its normal position in early life, or its removal in early adult life. Bulkley expresses the opinion that if only one testicle is undescended and the other is in normal position, the former should be removed; but if both are undescended the operation is not advisable, probably for certain assumed sexual or biologic considerations.

To assume that an abnormally placed organ is relatively more prone to degeneration or malignant growth is not, in my opinion, a surgical superstition, but is in accordance with sound biologic laws. Neither an entire organism, nor a part, develops as naturally in structure and function in an unhealthy environment. Decay or degeneration under such conditions is a natural response to the exacting demands of natural biologic laws.

The cure of an advanced case is exceptional and requires several years to determine. The mixed toxin in the case reported undoubtedly had a repressive or inhibitory, influence on the growth and progress of the tumor and must have been instrumental in promoting the disappearance of the nodular condition, observed in the exploratory operation, Dec. 6, 1913.

There should be no question as to the propriety and advisability of removing the testicle in early adult life in case only one is misplaced, whether the testicle is in the inguinal canal or within the abdomen. In the latter case, the Roentgen ray may be utilized in determining its location, if this is not revealed by palpation. If both are misplaced, one testicle being in the abdomen and the other in the canal, discretion and sound judgment would dictate the removal of the intra-abdominal testis, but not the inguinal, unless manifest disease of the organ demands it. The inguinal testis is always subject to observation and watching, the intra-abdominal never. It is, therefore, whether more prone to malignant change or not, the greater menace to life because of its secluded position, and of the insidious character of malignant disease and of the fact that the tumor has reached the point of great danger before it is observed.

ABSTRACT OF DISCUSSION

DR. WILLIAM B. COLEY, New York: I believe the very remarkable result obtained by Dr. Grant was largely due to the excellent judgment which he exercised in the administration of the treatment, and to his perseverance in keeping it up for a long period. Dr. Grant has brought up a number of important points for discussion: First, the tendency of the undescended testis to undergo malignant degeneration. There is a very wide diversity of opinion on this point. Originally I agreed with W. McAdam Eccles, who held that there was no evidence of such tendency. My first twenty-five cases of sarcoma of the testis showed no evidence of an undescended testicle, the twenty-sixth and twenty-seventh both were of the undescended variety. In 1914 I reported 64 cases of cancer of the testis in which

not less than twelve occurred in the undescended testis, and of these five were of the abdominal ectopia. Since I have observed six other cases none of which were of the abdominal variety. With regard to the treatment of this condition, I do not agree with Bulkley, who advocates the removal of every abdominal ectopic testis unless double. In cases in which the testis does not descend before the age of puberty, it is possible in nearly every instance to bring the testicle down into the scrotum by Bevan's operation. In rare cases in which the testis cannot be brought down, I believe it wiser to remove it rather than to place it in the peritoneal cavity. Inasmuch as antecedent trauma has been observed in about one-third of all the cases of sarcoma of the testis one would have to consider the operation of bringing the testicle down, as a possible factor in causing malignant degeneration. In one case which I observed there was good reason to believe that the trauma, incident to the operation of bringing the testicle down into the scrotum, was the immediate exciting factor in the causation of a sarcoma which developed shortly after the operation. On the other hand, in 281 operations for undescended testis in addition to nearly 100 cases which were operated on in other hospitals, no case of sarcoma developed after operation. The prognosis of sarcoma of the testis in general is very bad while that of sarcoma of the undescended testis is still worse. In view of the generally admitted hopelessness of malignant disease of the testis, there has been a strong tendency during the last two or three years to advocate a very extensive and radical operation, consisting in the removal of all of the retroperitoneal and preaortic glands—a very grave operation and thus far attended with a mortality of 11 per cent. I hold the opinion that it is unwise to submit the patient to such a prolonged and grave operation when the chances of saving his life by the operation are outweighed by the chances of death from the operation. I would propose the following method as a substitute to the radical operation just discussed: In primary cases, as soon as the diagnosis has been made, I would advise the immediate removal of the testis and cord, as high up as possible through the Bassini incision for inguinal hernia. Second, I would advise, beginning, as soon as the wound has healed, a routine prophylactic treatment with the mixed toxins of erysipelas and *Bacillus prodigiosus*, the same to be carried out for a long period of time, at least six months and in some cases a year. This treatment could easily be carried out by the family physician without interfering with the patient's ordinary occupation.

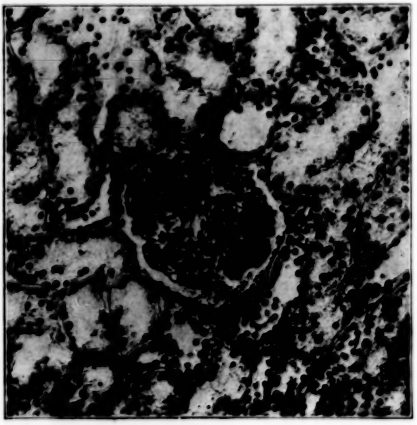

Fig. 1.—Normal cortex, × 390, in same tissue section from which the following pictures were made.

DR. W. W. GRANT, Denver: In reference to the postoperative treatment of these cases: If you will remove the growth completely these patients ought then to have some treatment of a prophylactic character. There are but two methods that we know of of any value whatever. One is is the use of the toxin made by Dr. Martha Tracy of Philadelphia and the other is the Roentgen ray. I believe these measures ought to be continued for a long time, for many months, if not for two or three years, because we never know when the patient has reached the period of complete cure. It may be three years, five or more. I therefore commend that feature always to your earnest consideration.

THE SURGICAL PROBLEM OF UNILATERAL SYMPTOMLESS HEMATURIA

ITS CAUSE AND SURGICAL RELIEF *

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Nearly every surgeon is occasionally confronted with a case of symptomless, unilateral bleeding from the kidney, and in most instances he must face the difficult problem of solving the pathologic problem if possible and then directing his treatment accordingly.

The first purpose of this paper is to exclude those specific causes of unilateral hematuria, namely, stone, tuberculosis, new growths and hydronephrosis, and secondly to discuss only that type which has in the past been classified under the misnomer of "essential." In order that this term "essential" shall be aptly applied we must have a case of painless bleeding in which the kidneys show absolutely no infectious agent, no organic changes and no clinical evidence of functional insufficiency. We do not recognize that such a negative condition can exist with a hematuria, and believe that in every case of unilateral renal bleeding there occur definite changes in the kidney which act as the direct causative factor.

The etiology of the so-called essential hematuria has been discussed at length in many valuable articles appearing during the last five years, but it is the purpose of this paper to consider only our findings in the human and experimental cases we have personally studied.

In considering the many theories and deductions so far advanced as to the cause of this condition, one is forced to conclude from the evidence in hand that there is only one of material value, and this is nephritis. There is little room to doubt that the bulk of the pathologic evidence is in favor of some form of chronic inflammatory change in the kidney acting as the exciting factor in symptomless, painless and more or less continuous unilateral hematuria.

The great drawback to this evidence being accepted as conclusive is the wide variance in the pathologic observations so far recorded, and the chief obstacle seems to lie in our interpretation of what is nephritis. Recent experimental work would not exclude a com-

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

bined vascular and epithelial nephropathy, but changes in the kidney resulting in hemorrhage as the one symptom must necessarily be confined principally to the vascular elements. In order to prove that certain chronic inflammatory changes in the kidney are the cause of this bleeding, we must first demonstrate a

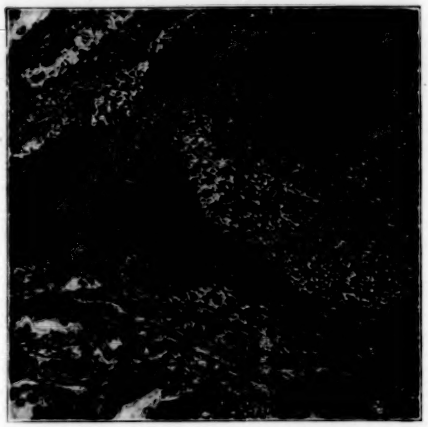

Fig. 2.—Area of recent infection in papilla, × 188. Exudate consists of fibrin, blood cells and polymorphonuclear leukocytes.

direct relationship of these changes to the renal vessels, and then show these vessels to be the actual source of the bleeding.

There has been but one type of lesion so far reported which would seem to us to be the probable cause of bleeding in this condition, and that is the renal varix reported by Fenwick,[1] Cabot,[2] Braasch,[3] Newman,[4] Pilcher,[5] Baum,[6] Payne[7] and Ballenger.[8]

Our studies are confined to eleven human and six cases of experimental hematuria which we have succeeded in producing on the dog. In the first eight human cases our findings seemed to coincide with those of other investigators, namely, nephritis, interstitial nephritis and glomerulonephritis. It is to be recorded, however, that nephrotomy was done in these cases and sections of the cortex only were studied. Fifteen months ago we did our first nephrectomy for this condition, and in this case we were able to demonstrate for the first time the actual source of the bleeding to be from dilated veins in the pyramids and on the free surface of the papillae. Since this first case we have had two more human cases which showed the same pathologic changes, namely, few if any changes in the cortex, a marked overgrowth of chronic inflammatory tissue in the medulla and pyramids which surrounded the vessels of this zone, and these vessels in turn dilated and resembled varicosities. In those cases of experimental nephropathy in the dog in which we have succeeded in securing a condition of hemorrhage analogous to the clinical type under study, the same changes in the kidney have obtained.

In our experimental study of hematuria we have learned to recognize two distinct types resulting from infection: first, the early form of bleeding from acute inflammation with diapedesis, and second, a cessation of this hemorrhage with return of more or less constant bleeding when chronic inflammatory changes occurred in certain definite areas of the kidney. In any chronic progressive infectious process, sooner or later there results a secondary damage to the tubules and a replacement fibrosis. The effect of this fibrosis on the circulation in the kidney depends on its relationship to the renal vessels. Certainly in two human cases of symptomless unilateral hematuria which we have studied, this overgrowth of connective tissue in the papillae and at the corticomedullary junction had resulted in such impediment to the return venous flow from within the kidney that varicosities had been produced, both within the substance of the medulla and on the free surface of the papillae, and actual hemorrhage from these vessels was demonstrated.

We do not want to draw from these studies any dogmatic conclusions; but we can say definitely from our observations in the human and experimental kidneys examined by us that the hemorrhage is due to chronic inflammatory changes in the medulla and pyramids resulting in an obstruction to the venous return and subsequent hemorrhage by diapedesis or actual rupture of the capillaries. Of special importance in this connection, our studies show the formation of connective tissue at the corticomedullary junction which hinders the return venous flow from those veins found in the medulla below this point, the

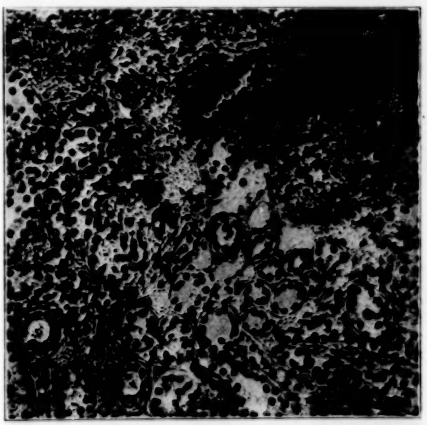

Fig. 3.—Overgrowth of connective tissue in medulla with distention of capillaries, × 190.

venulae rectae, which pass up to the corticomedullary junction to unite with other veins before finally leaving the kidney.

In this connection we wish to record three cases, one human and two experimental in the dog, that we have observed to have microscopic stone formations in

1. Fenwick: Brit. Med. Jour., June 17, 1905.
2. Cabot: Am. Jour. Med. Sc., January, 1909.
3. Braasch, W. F.: Clinical Observations on Essential Hematuria, THE JOURNAL A. M. A., Sept. 20, 1913, p. 936.
4. Newman: Brit. Jour. Surg., No. 1, 1913.
5. Pilcher: Ann. Surg., 1909, p. 65.
6. Baum: München. med. Wchnschr., 1913, No. 5.
7. Payne: Tr. Southern Surg. and Gynec. Assn., 1915.
8. Ballenger: Jour. Rec. Med., Atlanta, 1915.

the pyramids surrounded by an overgrowth of chronic inflammatory tissue which obstructed the return flow in the straight veins with coincident hemorrhage. A possible explanation of the relationship between this type of calculus formation and the hemorrhage is that the stones resulted from a chronic focal infection and they in turn stimulated the connective tissue overgrowth. We are not in a position to say that all cases of so-called symptomless hematuria are due to the changes here described, but report our observations as additional light on the unsolved pathologic problem.

Fig. 4.—Dilated venules at tip of papilla, × 45. In some, the blood has not coagulated; in others, clotting has occurred, and hyaline degeneration of the thrombus is beginning; in others, the hyaline change is complete, while some show beginning organization.

The one great argument brought forth by many observers against nephritis being the cause of this condition is the comparatively large number of chronic nephropathies which do not bleed. In reply to this well taken point we would say that in the ordinary severe types of chronic nephritis the bulk of the changes are in the cortex, whereas the changes here recorded are found in the medulla and pyramids. Further, in our studies of experimental nephropathies we have so far found a bleeding kidney only in those cases in which the principal changes have occurred in the medulla and pyramids. In this connection it would be interesting to know what those cases observed by other men would show if viewed from this light and careful studies made of serial sections taken from the pelvic zone. Certainly small sections from the cortex would show nothing convincing, as evidenced by the eighty-odd histologic reports found in literature.

The contentions of Randall[9] and Spitzer[10] that congestion or venous stasis is the true cause of this condition more or less coincides with our findings, only these observers failed to locate the exciting factor as a focal lesion within the kidney proper. It is a fact that certain extrinsic causes, such as movable kidney, pressure stasis from tumors, and cardiac and hepatic lesions, will cause hematuria, but these are specific causes which do not obtain in the type of case under study. Again, congestion from extrinsic causes will usually produce a mild hematuria, while most of those so-called essential cases bleed profusely at times.

TREATMENT

Nephropexy.—This has been advocated, but one can readily see how futile this would be in the type of case in which definite focal lesions in the kidney are producing the hemorrhage. It should be applied only in those cases in which marked mobility can be shown to interfere with the blood supply of the kidney.

Decapsulation.—This is a procedure which has been reported as curative in seventeen cases found in literature; but the rationale of the operation is not such as would commend it for routine use. A collateral circulation would be the most reasonable explanation for a cure after decapsulation, but according to the conclusive experiments of Katzenstein,[11] stripping of the capsule absolutely prevents rather than favors the formation of a new circulation. The question of a new growth or a small tuberculous focus is always a serious possibility in these cases, and decapsulation without nephrotomy does not provide for inspection of the kidney substance or pelvis. We had one such case seven years ago, diagnosed essential hematuria, which showed a small focus of tuberculosis in the lower pole when nephrotomy was done. Similar reports have come from Israel, Rovsing and others, and it is just these serious possibilities in this unsolved pathologic problem which should preclude decapsulation alone as a safe surgical procedure. On the other hand, there are several cases reported in which decapsulation failed to cure and nephrectomy was later done.

Fig. 5.—Greater portion of papilla, × 116. Here is shown the opening of a duct of Bellini and numerous distended venules; some venules show no blood; others have noncoagulated blood, and yet others show thrombi undergoing hyaline degeneration.

Nephrotomy.—The one procedure which has yielded the best results is nephrotomy with bisection from pole

9. Randall, Alexander: The Etiology of Unilateral Renal Hematuria, The Journal A. M. A., Jan. 4, 1913, p. 10.
10. Spitzer, W. M.: Continuous Painless Renal Hemorrhage and Its Treatment, The Journal A. M. A., Dec. 12, 1914, p. 2110.
11. Katzenstein: Ztschr. f. exper. Path. u. Therap., 1911, ix.

to pole and down to the pelvis; but we find nine cases reported in which this method failed to cure. We have had eight cases treated by nephrotomy with suture in which cure followed in every instance. Some of the failures accredited to this procedure may be due to the insufficient method of performing the

Fig. 6.—One long dilated venule just under the epithelium covering the papilla, × 300.

nephrotomy. We know of two such instances in which the operator explored the kidney and pelvis through an opening just large enough to introduce one finger. Certainly in many of these cases the condition is essentially an infectious process, and this may explain why nephrotomy in some instances has failed to produce a cure. Since nephrotomy does not remove the infection, we may expect a temporary cure in a small percentage of cases, for it is possible that the same sequence of pathologic events as described above may recur, which would result in a return of the hemorrhage and finally demand nephrectomy for an ultimate cure. There are also numerous cases of nephrotomy reported in which nephrectomy was done within the succeeding forty-eight hours because of severe postoperative hemorrhage. Since we have had no such experience, we believe this complication is probably due to the technical fault of improper coaptation with mattress sutures. The method of complete bisection probably cures through thrombosis or the establishment of a collateral circulation within the kidney, which relieves the distention of the varicosities.

Nephrectomy.—This is a certain method of cure, but too radical to commend itself as a routine procedure. We have removed the kidney in two cases in which the exigency of the occasion demanded it. One showed such large and numerous varicosities, a condition unlike anything observed by us before, that nephrectomy was deemed wise. In the other case both main renal veins were accidentally lacerated, and we were afraid to leave the kidney in situ. This fear was emphasized by the belief from our human and experimental cases that the clinical condition is primarily one of focal venous stasis within the kidney. In cases in which the bleeding has produced a critical condition of the patient, and in those cases in which nephrotomy has failed to relieve, nephrectomy is clearly indicated, provided the other kidney is present and its functional capacity good.

Nonoperative Treatment.—This consists of styptic injections into the kidney pelvis and the hypodermic administration of vaccines, horse serum, human serum and whole blood into the circulation. The conservative treatment of these cases, however, demands serious consideration, for one can never know, until a case is proved cured, but what a new growth, a tuberculous focus or an undetected stone may be the exciting cause of the one symptom hemorrhage. In acute or subacute cases in which an infectious agent can be isolated, it is well to try vaccines. Given a case of mild unilateral renal hemorrhage without pus, a negative roentgenogram, a normal pyelogram and little or no functional impairment, which can be kept under constant observation, we believe that it should be treated conservatively by epinephrin to the kidney pelvis and serums hypodermically. Where the bleeding can be controlled by the use of epinephrin or serum, it is possible to study the urine free from blood, and for this purpose can be recommended in every case. With this method there is always the danger of masking the one symptom hemorrhage, while a possible malignant or tuberculous process is left unrecognized to progress. In dealing with such a case of unknown pathology these procedures are to be condemned unless the patient can be kept under our control and constant observation. When the conservative treatment fails, or the bleeding has existed for several months with a resulting anemia coupled to an uncertain diagnosis, then we believe that surgery should be resorted to without delay.

Fig. 7.—Thrombosis of large vein just under the surface epithelium covering the papilla. Red blood cells are shown in the center, while the edges of the thrombus are beginning to undergo hyaline degeneration.

CONCLUSIONS

In our study of three human and six experimental cases we have demonstrated definite lesions in the medulla as the exciting factor, and believe that the term "essential" as applied cannot be maintained.

In our cases the following sequence of events has apparently taken place in the pathology of the kidney.

1. An infection which has been localized to foci in the medulla; no areas of infection have occurred above the corticomedullary junction.

2. The repair of these infected areas by the formation of dense masses of connective tissue.

3. This fibrosis has produced an obstruction to the venous return from the medulla and papillae through the venulae rectae.

4. As a result of this obstruction, varicosities have developed which not only appear in the substance of the papillae and just under the epithelium covering the papillae, but finally rupture on the free surface of the papillae and discharge their blood.

We hope that this work will help to clarify the true cause of these so-called cases of symptomless hematuria, and believe that other men will report similar findings if their cases are studied from the point of view here recorded.

Fig. 8.—Large vein which has ruptured on the free surface of the papilla and discharged its contents (× 45).

ABSTRACT OF DISCUSSION

DR. HUBERT A. ROYSTER, Raleigh, N. C.: Dr. Payne has discarded the term "essential." The more we study disease the less use we have for such terms. I am sure Dr. Payne is correct in assuming that this condition of hemorrhage from the papillae does form a certain percentage of the unexplained cases. In regard to the etiology, there may be many and various factors to consider. The term nephritis is just as little understood today as it was some years ago and the expression nephropathy which the essayist used is probably as good as any to cover all the shades of etiologic meaning. Now what may be some of the causes back of the so-called nephropathies? In the first place alcohol and other toxic agents may cause a one-sided nephritis just as well as a bilateral nephritis. It may be taken for granted that these agents could produce an affection in one kidney without affecting the other kidney. Concerning the pathology, Dr. Payne is probably on the right track. In many cases it may not be possible to demonstrate any pathologic change whatever. In other words, there may be no organic evidence of bleeding; but, if one can discover uniformly such changes as have been described, it might be possible to solve the problem.

Fig. 9.—Diagram of renal vessels (from Beattie and Dickson): *A*, cortex; *B*, midzone (corticomedullary junction); *C*, medulla. Areas *B* and *C* represent points at which the connective tissue causes obstruction to the straight veins.

Given, then, a case of one-sided bleeding from the kidney, what shall we do about it? We must not overlook the very important point, that is, the possibility of an early tuberculosis in every case of bleeding kidney. I agree that decapsulation is to be condemned, but if it gives the results reported it might not be harmful. I remember the incision of the capsule to relieve pain and in some cases it also relieves hemorrhage. I would suggest that, in cases where nephrotomy has been done, and nephrectomy decided not to be done, instead of closing the kidney with sutures we might, as I have done in two instances, wrap it up in a bundle as we do a package. Instead of having needles going through after being sliced up, wrap the kidney together by catgut as you would tie up a bundle. Finally, if most of us had such a case as described by the author we would undoubtedly institute conservative treatment until the actual cause was demonstrated, except in the extreme cases referred to by him.

DR. J. SHELTON HORSLEY, Richmond, Va.: This question of essential hematuria has worried all of us who do general surgery. Of course, many cases of renal bleeding are due to stones, to tuberculosis, to hypernephroma, but there remains a group which would have been difficult if not impossible to explain. Dr. Payne's sections show the pathology beautifully and also how easily the lesion might be overlooked. The section through the cortex showed perfectly normal structure. The papillae give the pathognomonic feature of the disease. It is common to find inflammatory lesions in the cortex where we would expect them, particularly in hematogenous infection or nephritis which occurs from toxic material in the blood. It is comparatively rare to find lesions in the papillae, but at the same time they do occur there, as Dr. Payne has demonstrated. The section showing a dilated vein bleeding seems to be conclusive. This corresponds with pathology elsewhere, for instance, dilatation of the veins in cirrhosis of the liver. Inflammation produces scar tissue which constricts the veins and causes them to dilate distal to the constriction. In regard to the treatment, I recall some excellent work done by Moore and Corbett regarding the type of sutures to be used for nephrotomy. They show that while the mattress suture controls hemorrhage it tends to destroy the kidney substance by necrosis, and they recommended simple interrupted sutures lightly tied.

DR. R. L. PAYNE, JR., Norfolk, Va.: There is no question that many of these cases are bilateral, and one kidney may bleed at one time and one at another. It is very probable that the focal infections we have observed in the kidney follow along the line described by Eisendrath, namely, some lymphatic infection. The pathology we see in these slides shows vessels with free blood, some with clotted blood, some with hyaline degeneration; in some organization has occurred. These vessels originally dilated before occluding and organization later began in the vessels that bled when finally ruptured. That is probably the explanation of how some of these vessels bled and eventually wound up with an ultimate cure by organization and that will, in addition, explain how decapsulation helps to cure them. When you decapsulate, the handling causes trauma which produces a condition favorable to thrombosis, and that is probably how decapsulation cures. The condition is really self-limiting in the bulk of the cases.

COMPARATIVE RESULTS IN ANTIRABIC TREATMENT

WITH THE PASTEUR METHOD AND WITH DESICCATED VIRUS *

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Pasteur's method for antirabic treatment stands as such an imperishable landmark of experimental medicine that one hesitates to point out even one or two minor defects. But the fact is that nearly all who now prepare the virus for treatment, including the Pasteur Institute, have made changes in the original method of preparation. In the original method Pasteur found that the serial passage of rabies virus from rabbit to rabbit by subdural inoculation resulted in a steady shortening of the incubation period until it becomes stationary or fixed, with an incubation period of six days. The spinal cords of these rabbits gradually lose their infectivity if dried over potassium hydroxid. When the temperature is kept at 23 C., the cords are not infective after the ninth day.

Pasteur's method of treatment began with the injection of 1 cm. of cord dried for fourteen days, followed, day by day, for eighteen to twenty-one days, with cord of increasing infectivity, the two-day cord being the most infective which he felt could be used without infecting the patient. The effect of these injections is that in the course of three weeks immune bodies appear in the blood; and those patients survive in whom the incubation period of the infection is longer than the time required for the establishment of an active immunity. This required time is from fifteen to twenty days after the completion of the treatment. The success of the treatment depends, therefore, on the fortunate circumstances that in man the incubation period of rabies is seldom less than three or four weeks and is usually about seven weeks. Pasteur regarded as complete failures only those patients who developed hydrophobia later than fifteen days after the completion of the treatment.

The preparation of the cords according to Pasteur's scheme requires the daily inoculation of one or more rabbits and the removal of the cords. It is therefore expensive and demands facilities which are to be found only in large, well-equipped laboratories. Modifications of the method have had for their object the establishment of an immunity which would appear earlier and be greater than that afforded by the Pasteur treatment. This has been sought for by the injection of virus of greater infectivity; by other methods for altering the infectivity of the virus, as, for example, heat, chemicals, dilution, dialyzing; by the simultaneous injection of serum, or sensitized vaccine.

Of the various modifications adopted, the earliest was proposed by Högyes.[1] This method is based on the fact that Pasteur's attenuation of cords by drying resulted only in a numerical destruction of the organisms. Högyes therefore devised a scheme of diluting fresh virus and injecting increasing quantities from day to day. The use of this scheme has been followed by excellent results. Ferran advocated and used small quantities of emulsified fresh cord. Proescher injects a relatively thick emulsion of fresh brain, and gives fewer injections. Calmette introduced the use of glycerol for preserving the cords. Fermi kills the organism by emulsifying the cord in 1 per cent. phenol (carbolic acid) and injects this noninfective material. He claims his results are better than can be attained with the Pasteur method. Marie,[2] in the Pasteur Institute, gives a sensitized virus which has been acted on by antirabic serum. His results are better than those obtained in the institute before the adoption of this modification. Excellent results have followed the use of virus dialyzed according to the method proposed by Cummings.[3]

The modification of the Pasteur method which I wish to describe now is founded on Shackell's[4] very original investigations on the effect of desiccation in vacuo at a low temperature. The earlier experiments are recorded in a joint article with Shackell.[4] This method has for its object the preservation of fixed virus, in order that it may be prepared in quantity and be always available for treatment. By using both brain and cord, enough material is obtainable for thirty complete treatments with the virus from a single rabbit; and since the material can be stored until needed, there is no waste and no unnecessary work is required of the laboratory staff during periods when patients are lacking or very few. Furthermore, with this product, treatment may be administered in less than half the number of days required by the original method.

The preparation of the material is as follows: Brain and cord, stripped of pia and blood vessels, are ground in a mortar into a homogeneous, thick, paste-like mass; carbon dioxid snow, collected from a tank into a sterile cloth, is added to the paste until freezing is complete and until further grinding reduces the mass to a fine powder. This powder is transferred quickly to a cold beaker and placed in a Schibler's jar which has been submerged in a mixture of salt and ice (—18 C.). In the upper part of the jar is a beaker of concentrated sulphuric acid. A vacuum of less than 2 mm. is produced and the powdered brain is kept at —18 C. in the salt and ice until desiccation is complete. A single brain and cord will be completely dehydrated in from thirty-six to forty-eight hours. A more detailed description of the technic may be found

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Högyes: Lyssa, in Nothnagle's Spez. Path. u. Therap., Vienna, 1897.
2. Marie: L'etude experimentale de la rage, Paris, 1909.
3. Cummings: Jour. Infect. Dis., 1914, xiv, No. 1.
4. Shackell: Am. Jour. Physiol., 1909, xxiv, 325.

in the published papers relating to this method.[5] If the brain and cord have been thoroughly ground, completely frozen and absolutely dried at a temperature not above —18 C., the resulting powder will be almost as infective as the fresh untreated brain and cord. When kept in vacuo at 0 C. there is no appreciable loss in infectivity for several months. When kept in an ice box (8 to 10 C.) for 500 days this powder is five times as infective as an equal quantity by weight of Pasteur's cord that has dried five days.[6]

Harvey and McKendrick[7] have shown that when cords are dried slowly over potassium hydroxid the loss of infectivity is proportionate to the loss of water. They conclude that the small amount of water remaining in the cord after the ninth day is insufficient to keep the rabies organisms alive. Vansteenbergh[8] had already succeeded, some years before our experiments, in preserving the infectivity of rabies virus by drying this very rapidly in vacuo. In his experiments the material was spread out in a very thin layer and the vacuum produced very quickly at room temperature. The dried powder retained its infectivity for some months if kept in the dark, free from moisture; but the amount of infectivity so preserved was very small. Our explanation of the apparently contradictory results of these two methods of dehydration is that in slow dehydration the salts and other soluble materials in the cells of the brain and cord become more and more concentrated until a point is reached at which this concentration becomes sufficiently toxic to kill the enclosed organisms of rabies by direct chemical action. In the brain and cord dried over potassium hydroxid the loss of infectivity is proportional to the resultant concentration of the soluble substance. Vansteenbergh's partial success in desiccation in vacuo is due to the rapidity of the dehydration and partial avoidance of too great concentration. If the cord and brain are frozen and then desiccated, cell after cell is deprived of its ice, molecule by molecule, by volatilization, and, depending on the degree of freezing, there is therefore little or no possible concentration of salts or other soluble products. So long as the dried brain is kept dry its infectivity alters very slowly; but if this powder, which is hydroscopic, is exposed to air, water is absorbed, deliquescence occurs, chemical action begins, and all the infectivity is quickly lost. The amount of infectivity remaining after vacuum desiccation depends on the degree to which the material is kept frozen during the extraction. The preservation of infectivity afterward depends on its absolute freedom from moisture.

Numerous tests made with various lots of our desiccated virus showed the loss of infectivity to be constant and uniform, and demonstrated the value of the method as a means of preserving the virus. Experiments were therefore begun on dogs and rabbits to determine its value in immunization, and these showed conclusively that the material could be used with great advantage in antirabic immunization of rabbits and dogs. The results have recently been confirmed by Poor, Jelnick and Gibson in the New York City Health Department laboratories. In a personal communication, Dr. Poor has kindly furnished the following protocols of some of the work carried on to determine the comparative value of various modifications of the Pasteur methods with that of the original:

5. Harris: Jour. Infect. Dis., 1912, x, 369; ibid., xi, 397; ibid., 1913, xiii, 155; ibid., Ann. de l'Inst. Pasteur, 1912, xxvi, 372.
6. Harris and Shackell: Jour. Infect. Dis., 1911, viii, 47.
7. Harvey and McKendrick: Theory and Practice of Antirabic Immunity, Calcutta, 1907.
8. Vansteenbergh: Compt. rend. Soc. de biol., 1903, lv, 1046.

EXPERIMENT 1.—Pasteur's cord and Harris' desiccated virus were used. The animals in each series were treated ten days. The virus was sent from Dr. Harris' laboratory; age of virus two years. The minimal infective dose was supposed to be 0.1 mg. for the first day's treatment and 0.01 mg. for that of succeeding days, but according to our tests they were much lower. The exact minimal infective dose was not determined by us. The animals treated with this virus received the following doses, which constitutes the ordinary scheme proposed by Dr. Harris for treatment of human beings:

Day	Units
1st	500
2d	1,000
3d	1,500
4th	2,000
5th	3,000
6th	3,000
7th	3,000
8th	3,000
9th	3,000
10th	3,000

Unless otherwise stated this scheme was followed in all subsequent experiments. The rabbits in the Pasteur series received the full doses given to human patients on the first ten days of the regular course of Pasteur treatment.

Forty-three days after the end of treatment the animals were infected intracerebrally with the following dilutions of mixed virus:

One to 8,000 Harris' Virus:
Rabbit 1, discharged after seven weeks.
Pasteur Virus:
Rabbit 1, paralyzed in thirteen days.
Rabbit 2, paralyzed in seven days.
Controls:
Rabbit 1, paralyzed in seven days.
Rabbit 2, paralyzed in seven days.
One to 4,000 Harris' Virus:
Rabbit 1, remained well for thirty-two days, then developed snuffles and died.
Rabbit 2, discharged after seven weeks.
Pasteur Virus:
Rabbit 1, paralyzed in seven days.
Rabbit 2, paralyzed in six days.
Control:
Rabbit 1, paralyzed in seven days.
One to 1,000:
Rabbits of all series showed beginning symptoms of rabies in six days.

EXPERIMENT 2.—Pasteur and Harris' methods were used, and all animals were treated eleven days. Harris' virus was sent from Dr. Harris' laboratory. The minimal infective dose for the first day's treatment was 0.1 mg.; that of virus for succeeding days 1/50 mg. The animals were infected the day after the last injection with the following dilutions of fixed virus:

1 to 12,000

Control: Rabbit 1, paralyzed in ten days; Rabbit 2, paralyzed in seven days.

Pasteur virus and Harris' virus: Rabbit 1, discharged in forty days; Rabbit 2, discharged in forty days.

1 to 8,000

Control: Rabbit 1, paralyzed in seven days; Rabbit 2, paralyzed in eight days.

Pasteur virus: Rabbit 1, paralyzed in eight days; Rabbit 2, paralyzed in eight days.

Harris' virus: Rabbit 1, discharged in forty days; Rabbit 2, discharged in forty days.

1 to 4,000

Control: Rabbit 1, paralyzed in eight days.

Pasteur virus: Rabbit 1, paralyzed in eight days.

Harris' virus: Rabbit 1, discharged in forty days.

EXPERIMENT 3.—Harris' series, treated ten days; Pasteur series treated twenty-one days, starting eleven days ahead of the Harris series.

Harris' virus: Virus used for the first day's treatment made by Eli Lilly & Co.; minimal infective dose 0.1 mg. That for the succeeding days, made by us; minimal infective dose $\frac{1}{200}$ mg.; virus one month old. On the day after the last injection all animals infected with the following dilutions of fixed virus:

1 to 8,000

Control: Rabbit 1, paralyzed in seven days; Rabbit 2, paralyzed in seven days.

Harris' virus: Rabbit 1, discharged after thirty-eight days; Rabbit 2, paralyzed in seventeen days.

Pasteur virus: Rabbit 1, discharged after thirty-eight days; Rabbit 2, paralyzed in ten days.

1 to 4,000

Control: Rabbit 1, paralyzed in seven days; Rabbit 2, paralyzed in seven days.

Harris' virus: Rabbit 1, discharged in thirty-eight days; Rabbit 2, paralyzed in seven days.

Pasteur virus: Rabbit 1, paralyzed after six days; Rabbit 2, paralyzed in seven days.

The conclusions reached by Poor, Jelnick and Gibson is that the desiccated virus produces immunity more quickly than the Pasteur cords.

I have used this material during the past four years in the treatment of patients, and have been able to collect data on 1,159 patients treated with it. Of these cases, 359 were treated by me, 222 in the State Board of Health laboratory of Indiana by Dr. William Shimer, and 618 in the Charity Hospital, New Orleans, by Dr. M. Couret. Of this number, one died during the treatment, and one fourteen days after the first injection. With these two exceptions, there were no deaths and no cases of paralysis. If we follow the example of Pasteur and exclude these two cases the mortality is zero. But excluding one death in which symptoms developed on the tenth day during the treatment, and including the other, in which treatment had been completed, but in which symptoms developed on the fourteenth day after the first injection, there is a mortality of less than 0.1 per cent., a result that compares favorably with any of the other modifications.

Table 1 includes 319 patients treated by me in St. Louis and 618 by Dr. M. Couret in New Orleans.

TABLE 1.—DATA OF NINE HUNDRED AND THIRTY-SEVEN PATIENTS TREATED FOR RABIES

	Head	Hand and Forearm	Body and Lower Extremity	Contact	Total
Rabid	40	209	124	98	471
Probably rabid	25	159	95	..	279
Unknown	7	61	67	1	136
Probably not rabid	6	28	17	..	51
Total	..	...	...	..	937

Table 2 includes 222 patients treated by Dr. William Shimer, director of the Indiana State Board of Health laboratory, with virus furnished by Eli Lilly & Co.

The amount of desiccated virus and the number of injections used in the experimental work and in the cases treated were decided on after a study of the scheme of Högyes. In this scheme Högyes injected 54.575 mg. of cord in fourteen days in light cases, and 94.47 mg. in twenty days in bites on the face and head. Most writers agree that immunity is produced by the more or less altered rabies organism, and that the degree of immunity is proportional to the number of infective specific organisms injected. The infectivity of the cord is such that $\frac{1}{40}$ mg. is the least amount that will constantly infect rabbits.[7] Expressed in terms of infectivity, Högyes injected in mild cases 2,183 times the minimal infective dose; in severe cases, 3,898. Harvey and McKendrick calculate that in the Pasteur light scheme this number of times the minimal infective dose is 2,160.

TABLE 2.—DATA OF PATIENTS TREATED BY DR. SHIMER

Sex	No. Patients
Male patients	67
Female patients	32
Children, both male and female	123
Total	222
Where Bitten or Exposed	**No. Patients**
Head	2
Face	26
Hands	67
Feet	13
Legs	36
Arm	25
Body	5
External genitals	1
Cut by knife	1
Abrasion on hands	45
Handling child dying of hydrophobia	1
	222

TABLE 3.—RESULT OF EXAMINATION OF ANIMALS

Exposure	No. Patients
Bitten by rabid dogs	99
Bitten by dogs with positive gasserian ganglion	60
Bitten by dogs, probably rabid	28
Bitten by dogs which got away	25
Bitten by dogs, probably not rabid	1
Cut by knife	1
Bitten or exposed to infection from saliva from cows whose brains were found to contain Negri bodies	8
	222

TABLE 4.—TREATMENT

	No. Patients
Seven injections, 6,750 units	62
Fourteen injections, 19,250 units	71
Eighteen injections, 27,350 units	99
	222

TABLE 5.—NATURE OF THE WOUNDS AND EXPOSURE

Character of Exposure	No. Patients
Slight bites	74
Severe bites	103
Exposed to infection by contact	44
Handling hydrophobia patients	1
	222

The minimal infective dose of desiccated brain and cord is $\frac{1}{250}$ mg., and one can easily inject many times the total infective doses usually contained in Pasteur's scheme with a much smaller proportion of foreign nerve material. I prefer to give 500 minimal infective doses, or units, at the first injection; 1,000 units at the second; 2,500 each at the fifth, sixth and seventh. In severe cases the daily dose after the fourth injection may be 3,000. The usual mild case is treated in six or seven days; severely bitten patients are treated ten to fifteen days. Mildly injured persons received from 7,000 to 10,000 units. Dangerously bitten patients have received 30,000 to 70,000 units, or twenty times more than that given by Pasteur. In the treatment of a dangerously bitten patient the following record will serve as an example:

J. M., man, aged 24 years, bitten July 8, 1915, on the septum of the nose by his own dog. The wound bled freely, but was not cauterized. The dog developed rabies two days later, and died five days later. Negri bodies were present. Treatment was begun six days after the injury. Injections were made as shown in Table 6.

Of the 1,159 persons treated with this material, two died of hydrophobia. Couret[9] states the single failure

9. Couret: Personal communication to the author.

in the Charity Hospital cases was that of a 2-year-old negro child who received a slight wound over the right eye Oct. 6, 1915. Eight days later the mother applied for treatment, and the treatment was begun on that day. On the eleventh day of a fifteen-day treatment, the child developed symptoms of hydrophobia, and

TABLE 6.—ILLUSTRATIVE ANTIRABIC TREATMENT

Date	Amt., Mg.	No. Units
7/14	50	500
7/15, a. m.	15	1,000
7/15, p. m.	25	2,000
7/16, a. m.	10	2,000
7/16, p. m.	15	3,000
7/17, a. m.	15	3,000
7/17, p. m.	15	3,000
7/18	20	4,000
7/19, a. m.	15	3,000
7/19, p. m.	15	3,000
7/20, a. m.	15	3,000
7/20, p. m.	20	3,000
7/21	20	4,000
7/22	15	3,000
7/23	20	4,000
7/24	20	4,000
7/25	20	4,000
7/26	25	5,000
7/27	20	4,000
7/28	20	4,000
7/29	20	4,000
Total	315	66,500

the treatment was discontinued. The child died two days later. The wound was not cauterized at the time the injury was inflicted, and when the patient came for treatment, the wound was completely healed.

The other death occurred in my own series. The history in this case is as follows:

L. P., man, aged 52, farmer, was bitten July 1, 1913, by his own dog, which was killed and in whose brain Negri bodies were abundant. The patient was thrown to the ground by the dog, which then grabbed the hand in his mouth with the resulting extensive lacerations and deep penetrating wounds. Treatment was begun five days later, the injections being as shown in Table 7.

TABLE 7.—TREATMENT IN THE CASE OF L. P.

Date	Mg.	No. Units
7/ 6/13, a. m.	40	500
7/ 6/13, p. m.	20	1,500
7/ 7/13, a. m.	..	1,000
7/ 7/13, p. m.	..	1,800
7/ 8/13, a. m.	..	2,000
7/ 8/13, p. m.	..	2,000
7/ 9/13, a. m.	..	2,500
7/ 9/13, p. m.	..	2,500
7/10/13	..	2,500
7/11/13	..	2,500
7/12/13, a. m.	..	2,500
7/12/13, p. m.	..	3,000
Total	60	24,000

The twelve injections were given within a period of seven days at the urgent request of the patient, who desired to return home at harvest time. After his return he worked in the sun during exceedingly hot weather and became very much exhausted. On July 21, twenty days after he was bitten and fifteen days after the first injection, symptoms of hydrophobia appeared. He died of convulsions on the twenty-seventh.

If the value of this material in antirabic treatment can be judged by this record of 1,159 cases treated with but these two failures, in both of whom the disease developed before the possibility of antibody formation, the results obtainable will compare favorably with those obtained by other modifications of the original method.

Assuming from these data that the material has an efficient immunizing power, we can see that it possesses another, though minor, advantage over the Pasteur method. The average time required for the complete administration of the treatment is less than one-half the time required by the Pasteur method. The 936 patients treated by Couret and by me averaged less than ten days per patient, a saving of more than 9,000 days of treatment over what would have been required had we followed the Pasteur scheme. This is a matter of great importance to those who are obliged to travel from home to the city for treatment. As a concrete instance, the State Board of Health of Indiana has a fund for caring for indigent patients while they are receiving antirabic treatment. In one year the amount spent by the state for board was $900 less than it would have been had these patients received the usual Pasteur scheme.

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ABSTRACT OF DISCUSSION

Dr. Samuel James Meltzer, New York: I would like to ask Dr. Harris whether the dried virus could be pulverized and whether it could then stand the sterilization by dry heat without the effective part of the virus being destroyed. That the tissue, when dried, is more effective, reminds me of the statement of Dr. Novy that the addition of water to some substance reduces its anaphylactic effects.

Dr. W. W. Tompkins, Charleston, W. Va.: I wish to report a case in which there was a short period of incubation. One year ago last August a patient was bitten on the hand by a dog. The wound was sucked and over the wound was placed ordinary tobacco. The following Saturday the patient developed rabies with violent strangulation and choking and could not swallow fluids. On Saturday, one week later, I was called to travel a distance of seven miles, and found the patient with distressed and drawn features. He was rational, but afraid. I asked him to drive to town, and he said he would. The symptoms had already developed. At 2 or 3 o'clock that night he got out of the hospital and went back home. At 5 o'clock he had a severe convulsion and died. In this case I was impressed by the fact that in crossing the creek he had no difficulty about his larynx, but only when fluids were present. Three boys had been bitten by the same dog; the dog was killed and the head and spinal column sent to a pathologist, who said it was a case of genuine rabies. He advised that no time be lost, but that the cases be treated at once. One case was treated with serum, another by a "mad stone," the third by application of nitric acid to the wound. The question arises, was it a case of rabies or a mistaken diagnosis? A variety of treatments were tried and with equal good results.

Dr. Robert Alway Peers, Colfax, Calif.: We have had considerable experience with rabies during the past few years in California where rabies was epidemic and spread from the southern to the northern part of the state. Several hundred cases were treated at the State Laboratory at Berkeley. The length of time necessary to immunize a patient is extremely important, and any method which shortens the time of immunization is an advance. Not infrequently a person is bitten by a dog while an epidemic of rabies is prevalent in the community. It is not advisable to kill the dog at once because of the danger of killing the animal before the disease is advanced sufficiently to make a laboratory diagnosis possible. The dog should be kept chained and if he has rabies he will die within a few days. If the dog is kept several days before a diagnosis of rabies is made, there are then required twenty-one days treatment by the Pasteur method, and later fifteen days for immunization to become complete—more than forty days altogether, which is very near the danger line. For this reason, the method the doctor described, by shortening the time of immunization, is a great help.

UREMIA

A DIFFERENTIATION OF TYPES *

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When Bright noted an increase of urea in the blood and fluids of patients with severe nephritis and gave the name uremia to a group of symptoms likely to develop with these cases, he believed urea to be a highly toxic substance. The name uremia remains to us, although the term embraces now considerably more than urea intoxication. Under it are grouped several syndromes referable chiefly to the nervous system and with which no constant lesions are noted at necropsy outside the kidneys. Bright's observation that urea is increased in amount in the body fluids with certain renal defects established a principle which has been remarkably stimulating to later studies. This idea initiated that conception of uremia commonly called the retention theory, by which one means that some or all of the nitrogenous bodies normally excreted through the kidneys are, when these organs become diseased, retained in the body and give rise to symptoms. The corollary to this proposition, that the urine is specifically toxic, was debated and abandoned in the last century without elucidating any undisputed scientific facts.

So then we are still confronted by the question: Is the syndrome uremia due to a retention in the body of normal urinary substances, or is it induced by a wholly abnormal type of metabolism, resulting in new toxins? I am not intending to labor this question unduly, but I wish to bring to your attention some well-known facts which show just what may be expected from the retention of urinary bodies and then to apply these facts to uremia.

The state of complete anuria, that is, absolute retention, bears directly on this point. Whether induced by impacted renal calculus or by the removal of the only kidney or by such poisons as mercuric chlorid, the symptoms resultant are in all cases almost identical.

I have had an opportunity to study three persons in whom the only functioning kidney was removed surgically because of some diseased condition; the remaining kidney in these cases was infantile, atrophic and of no use. These cases all presented a condition of anuria, hence of complete retention in the body of all substances normally excreted through the kidney. It is well known that with such cases there are few or none of those symptoms which demark our conception of spontaneous uremia. Convulsive seizures, for example, are not observed. Nervous phenomena are conspicuously wanting, gastro-intestinal disturbances absent or appear only as moribund manifestations. The last case I saw was without significant symptoms for eight days and then an increasing sopor developed and death ensued within a few hours. This is the common experience and Ascoli was positive that the picture is quite different from that associated with renal disease and he called this syndrome urinary poisoning. The same symptoms are found with anuria due to mercuric chlorid poisoning, of which we see so many cases in New York; and I have induced an analogous state in dogs by nephrectomy, by ligation of both ureters, and by ligation of the renal arteries. The essential positive symptoms, either with man or in experimental animals, resulting from absolute retention, are progressive asthenia and anorexia; later, stupor and death. These facts I bring out with some prominence, since they enter into the more complex picture of true uremia. Urinary poisoning is a pure type.

Urinary poisoning, as I have described it, is produced by some rather sudden change in the excretory organs resulting in a prompt flooding of the tissues with nitrogenous waste products. Death is then a matter of days only. Now when the failure of elimination is not so rapid and the waste products accumulate in the tissue fluids more gradually, it is conceivable that the cells acquire a certain degree of tolerance and are not so injured as appears to be the case when the change is sudden. This conception has ample basis in analogy and explains prolongation of life under conditions which if effected suddenly lead quickly to dissolution. It is necessary to bear this possibility in mind as we proceed.

A rather close resemblance to the clinical picture of urinary poisoning is produced when, with advanced chronic nephritis of the hypertensive variety, there is added the complicating factor of cardiac dilatation and insufficiency. Let me explain just what appears to happen. With this type of nephritis the kidney has lost the power to secrete a concentrated urine and this is most conspicuous with respect to nitrogen. While a normal kidney on demand secretes urine containing 1.5 per cent. of nitrogen, the granular kidney may at best attain only 0.6 or 0.7 per cent., and not infrequently cannot arrive at 0.5 per cent. of nitrogen. Success then in freeing the body of its nitrogen waste is attained by increase of the urine volume. The normal kidney in secreting 1,000 c.c. of urine containing 1.5 per cent. nitrogen, has secreted 15 gm. of nitrogen, but the diseased kidney in order to secrete 15 gm. of nitrogen must secrete 2,500 c.c. of urine containing 0.6 per cent. nitrogen.

But with the increased urine volume the burden of work is transferred from kidney to heart. Now if the heart breaks down under its burden the volume of urine of course falls, and the nitrogen excretion falls with it, since the kidneys cannot accommodate themselves by concentration of urine as in pure cardiac disease. These conditions lead to nitrogen retention and an accumulation of slag in fluids and tissues. You will note that these conditions are the same in kind as with urinary poisoning; the difference is in degree, and therefore the clinical picture is slower in developing and more protracted. There is here gradually developing stupor, asthenia and anorexia. There is added one important symptom, namely, a mild delirium, which may be simply a mental clouding associated with disorientation, chiefly of place; occasionally there are real delusions of the persecution type. Edema may or may not be marked, dependent apparently on the degree of cardiac embarrassment, since when a patient improves the edema is prone to diminish as the blood pressure becomes more elevated. Symptoms indicating irritation in the motor centers are not observed when this type is pure.

This type of uremia is a mixed picture, but fundamentally it is a urinary poisoning, a retention syndrome induced directly by cardiac failure. There is found, of course, in the blood an increase in nonprotein nitrogen, which may be considerable, occasionally but slight, in degree. This type of uremia has in my experience been a rather common sequel to protracted

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hypertension; existing in the beginning without marked evidence of renal damage, what we commonly regard as primary arteriosclerosis. When these cases escape their chief danger, cerebral hemorrhage, a nephritis usually develops, but the kidney found at necropsy, while showing fibrosis, does not present the degree of destruction of renal elements noted in some other types of nephritis.

The clinical picture of nephritis which we associate with the large white kidney appears to be as little complex in reference to physiologic function as any type of renal disease. The clinical manifestations are related chiefly to disturbances in water and salt excretion. There is no unanimity of opinion as to the interpretation to be given the facts, but all concur that the conspicuous departure from normal relates to poor excretion of water and salt, the consequent anasarca, and the relatively normal excretion of urea and other nitrogen fractions. This type of nephritis but seldom progresses to uremia, it being the rule in my experience that protracted cases develop some terminal infection. Exceptionally, however, during the last period of life some uremic symptoms are in evidence. These are vomiting, headache, stupor, amaurosis due to edema of the retina, and finally coma.

Contrary to the statement of some, I have never seen convulsive seizures. The blood pressure remains normal, or subnormal. The blood and tissue analyses do not indicate any notable degree of nitrogen retention, even when corrected for the water excess. At necropsy, aside from nephritis, the conspicuous condition is edema, and this is peculiarly notable in the brain and meninges. Arguing from analogy, that is, the similarity of this picture clinically with some others associated with marked cerebral edema, I have felt that this edema must be in some way accountable for the cerebral symptoms. In our present state of ignorance concerning the causation of edema generally this idea cannot rest on a firm scientific basis. I have but one supporting fact, namely, that when lumbar puncture is done in these cases, the cerebrospinal fluid is found to be under increased pressure and after some fluid is removed there is a temporary clearing of the mental state of the patient. This hypothesis as to the causation of the stupor and coma observed in cases of nephritis with chlorid retention is advanced with every reservation. Until we understand edema we will not understand this type of uremia. The type is, I think, clear cut and associated with a form of nephritis which is well demarked by the functional change in respect to water and salt excretion,[1] the chloremique of Widal. Pathologically the kidney shows parenchymatous nephritis, that is, the large white kidney.

When this type of uremia is unmixed, there is never convulsive uremia as a sequel. On the other hand, a mixed nephritis may give rise to edema as a conspicuous symptom; but there is associated then also an increased blood pressure and an increased nonprotein nitrogen. When uncomplicated, the chlor-retention nephritis shows a normal or subnormal blood pressure and low nonprotein nitrogen. The degree of albuminuria helps not at all in the diagnosis.

Of the various manifestations due to uremia, none demarks a type so clearly as convulsive seizures. Convulsive or epileptiform uremia has been regarded by all students as different in causation, peculiar and specific. In discussions of uremia with convulsions it is commonly classified as a toxemia, although a toxin has never been isolated. There are several facts that I wish to call to your attention which lend some support to the idea that a toxin may be present. In the first place these cases, on metabolic study, all show periods of clear-cut nitrogen retention. There is as a rule an increase of nonprotein nitrogen in the blood also. Now, whereas the urine shows but 6 or 7 per cent. undetermined nitrogen, the blood nitrogen may be 20 per cent. or even more undetermined. This fact indicates either a selective excretion or formation of nonexcretable substances. These facts apply more or less to all types of nephritis with retention. Finally, all the organic poisons known are nitrogen containing compounds. Considerations of this sort brought out in my studies several years ago led me to think that an effort might be made to isolate a specific toxin from the blood or tissues in these cases and I believe this has been accomplished. A crystalline substance has now been separated from the blood in a series of cases of convulsive uremia. This substance is highly toxic; 200 c.c. of blood contains enough to kill a guinea-pig. The substance cannot be detected in normal blood or in blood in any diseased state except uremia of this type. The symptoms produced in animals after injection into the peritoneal cavity are dyspnea, fecal discharges, convulsions or muscular twitchings, coma and death. Of the chemical nature of this compound, its source in the body, its effect in producing organic changes, we cannot speak at this time.

Granting for the moment that this substance is specific and peculiar for one type of uremia, then the question arises, is it a normal catabolic substance which is in health excreted in urine, or is it a product of abnormal metabolism, a result of perverted processes instituted by renal disease? If this compound is a normal excretory product, then it should accumulate in blood and tissue in conditions of anuria; but as already mentioned, these cases do not resemble uremia. One case of complete anuria due to the removal of the sole functioning kidney (the other being infantile and atrophic) was investigated. This patient died nine days after the operation and immediately post mortem about 1 liter of blood was aspirated from the jugular vein. This blood yielded no toxic substance. The degree of retention is indicated by the nonprotein nitrogen which was 126 mg. per 100 c.c. of blood. The evidence of one case is not adequate, but it supports the original conception that in the convulsive type of uremia there is an abnormal metabolism, as well as a nitrogen retention.

There are then, according to my present conception, three pure basic types of uremia. The first is a simple retention of urinary nitrogenous waste, a urinary poisoning; the second is due to defective water and salt metabolism, resulting in cerebral edema; the third type is a toxemia, resulting from an abnormal catabolism. Two of these are dependent wholly on failure of excretion, either of nitrogen, water, or salt; a third, while it may show each and all of the three enumerated defects, is demarked by another element foreign to normal catabolism and resulting in toxin formation, which is manifested clinically by convulsive seizures.

Now clinically we see only exceptionally these types uncomplicated; just as we see but exceptionally pure types of renal disease; and this is so whether we consider the case from the functional physiologic aspect or that of microscopic pathology. The majority of

1. While the nitrogen metabolism shows no conspicuous abnormality, yet in every case that I have had an opportunity to observe a careful metabolic study has revealed a slight degree of nitrogen retention, a plus balance.

cases that evidence nitrogen retention also have more or less edema, at least at periods. Those in which edema is the striking phenomenon have usually slight or marked nitrogen retention if the case is studied for sufficient periods. The sections from these kidneys do not disclose a uniform picture; in one field the tubules or some part of these tubules appear chiefly diseased, in another section from the same kidney it may be that glomeruli seem more damaged, or the arterioles. And it is impossible to surmise from the appearance of a damaged tubule as to its degree of functional impairment. Hence uremia is ordinarily a complex picture, resulting from a mixture of physiologic defects and stamped clinically by that one which is predominant. Only by a rather careful study of many cases at bedside, in the laboratory, and at the necropsy table does one arrive at a conception of pure types. Pure types do occur, but they are the exception in my experience. These types fall into three main groups, depending on the nature of the functional defect in the kidney: (1) retention type, the urinary poisoning of Ascoli; (2) cerebral edema type; (3) toxic type, or epileptiform uremia.

THE VALUE OF RECENT LABORATORY TESTS IN THE DIAGNOSIS AND TREATMENT OF NEPHRITIS

WITH SPECIAL REFERENCE TO THE CHEMICAL EXAMINATION OF THE BLOOD *

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Chemical researches have recently added much to our knowledge of many pathologic conditions, but it is doubtful if any disorder has profited more than nephritis. The investigations have given us a clearer insight into this condition, have aided in diagnosis and prognosis and finally have been a guide to treatment.

For a long time the clinician has been accustomed to rely on the examination of the urine for his index of the efficiency of the kidney. In nephritis the volume, specific gravity, albumin, casts, and occasionally, the chlorids and total nitrogen or urea have covered the examinations made. More recently the ability of the kidney to eliminate various substances administered, either per os or parenterally, has been practically employed as a means of determining its functional activity. The phenolsulphonephthalein test of Rowntree and Geraghty [1] and the lactose and potassium iodid tests of Schlayer [2] have found extensive use, especially the former. The phenolsulphonephthalein test, although introduced only six years ago, has received almost universal recognition.

The finding of albumin and casts in the urine is unquestionably of great diagnostic value in nephritis and of considerable prognostic value in the acute and subacute forms of the disease. In the chronic forms, however, there has been a growing tendency to place less and less reliance on this information from the standpoint of prognosis.

Recently Mosenthal [3] has excellently discussed a number of well-known clinical observations on the urine. He has pointed out that a very considerable amount of information may be obtained from the observations of the volume, specific gravity, chlorids and nitrogen output of the night and two-hour day urine specimens of nephritic patients, when placed on a definite test diet. The normal individual is able to secrete at night a urine of high concentration, but in nephritis the specific gravity may be fixed at a constant level with a very definite concentration of chlorids and urea. The importance and diagnostic value of this has not been fully appreciated, primarily because of the time and care required in the collection and analysis of the specimens.

The introduction of the phenolsulphonephthalein functional kidney test by Rowntree and Geraghty in 1910 not only supplied us with a most valuable diagnostic and prognostic test, but furnished the impetus in this country to numerous investigations on the functional activity of the kidney. With the introduction three years later of simple methods of blood analysis, especially at the hands of Folin and his co-workers, the possibilities of these new methods as practical diagnostic tests were quickly appreciated.

In some quarters the nonprotein or incoagulable nitrogen alone has been employed as a test of kidney activity, while in others the urea has been utilized. McLean,[4] in particular, has emphasized the value of a comparison of the urea of both blood and urine, somewhat after the method employed by Ambard. So far as we are aware, in institutions other than our own, the uric acid has been used chiefly in connection with the diagnosis of gout.[5]

Although considerable attention has been given to the urea and nonprotein nitrogen [3] of the blood in nephritis, scant consideration has been accorded the uric acid and creatinin. It is true that the greater part of the waste nitrogen is eliminated in the form of urea, but it does not necessarily follow from this that data on uric acid and creatinin are unimportant and uninteresting. We do not believe that it is possible to make satisfactory deductions regarding nitrogen retention from the urea or nonprotein nitrogen determinations alone. The scheme we now employ for the examination of the blood entails the determination of the uric acid, urea, creatinin and sugar as a routine with estimations of the carbon dioxid combining power according to Van Slyke in cases in which this appears to be indicated. The determination of the urea concentration of the blood is, we believe, of more value than that of the nonprotein nitrogen for the reason that it represents the retention of a definite compound and, further, is more easily and accurately determined.

The phenolsulphonephthalein test is so far superior to any other general functional kidney test that one scarcely need mention any other test in a brief discussion. In comparison with the chemical examination of the blood it is believed that the latter method gives

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1. Rowntree and Geraghty: Jour. Pharm. and Exper. Therap., 1910, i, 579.
2. Schlayer and Takayasu: Deutsch. Arch. f. klin. Med., 1910-1911, ci, 333.
3. Mosenthal: Arch. Int. Med., 1915, xvi, 733.
4. McLean: Jour. Exper. Med., 1915, xxii, 212, 366; Clinical Determination of Renal Function by an Index of Urea Excretion, THE JOURNAL A. M. A., Feb. 3, 1916, p. 415.
5. A very complete discussion has been given by Tileston and Comfort: Arch. Int. Med., 1914, xiv, 620.

much more definite information in many cases. In our work, however, we have almost invariably employed the phenolsulphonephthalein test, either previous to or in conjunction with the blood examination. Another very important point in favor of the chemical examination of the blood, compared with the quantitative examination of the urine, is the difficulty and time required in the collection of urine specimens. It is our opinion that the chemical examination of the blood, when good laboratory facilities are available, requires less of the physician's time and gives him more definite information.

Both Mosenthal[6] and Foster[7] have called attention to the fact that the increase in the nonprotein nitrogen of the blood in nephritis is quite insufficient to account for the amount of nitrogen retention. Despite this fact, the degree of the retention of the various waste products affords an excellent index of the severity of the condition, and probably a fair index of the retention in the later stages of the disease, particularly as regards the uric acid and creatinin.

acid is generally the first to become evident. In harmony with this hypothesis, we should next expect a retention of urea and lastly that of creatinin. That such is the case is quite evident from an examination of Table 1, giving analyses of typical cases of patients suffering from various stages of nephritis.

According to this view a retention of uric acid should constitute one of the early signs of incipient interstitial nephritis, while an appreciable retention of creatinin should indicate a grave impairment in the functional condition of the kidney and therefore should be a valuable prognostic test.

Theoretically, the creatinin of the blood should be a safer index of a lowered kidney activity than the urea, for the reason that creatinin on a meat free diet is entirely endogenous in origin and its formation (and elimination, normally) very constant. For the same reason it must be evident that a lowered nitrogen intake may reduce the work of the kidney in eliminating the urea and to a certain extent the uric acid, but cannot affect the creatinin to any extent. The handicap

TABLE 1.—URIC ACID, UREA NITROGEN AND CREATININ OF BLOOD IN INTERSTITIAL NEPHRITIS*

Date, 1915-16	Case	Age	Sex	Diagnosis	Condition	Mg. per 100 C.c. of Blood			Phthalein 2 Hrs., per Cent.	Systolic Blood Pressure	Urine	
						Uric Acid	Urea N	Creatinin			Albumin	Casts
I												
9/17	H. L.	22	♂	Pulmonary tuberculosis	Unchanged	6.5	16	2.7	58	130	++	+
8/10	E. H.	41	♂	Pericarditis	Unchanged	5.6	13	2.1	45	150	—	—
10/12	F. D.	45	♂	Interstitial nephritis	Unchanged	5.5	12	2.5	37	185	—	+
2/6	B. D.	35	♀	Diffuse nephritis	Unchanged	9.6	19	2.4	45	175	+	+
II												
8/11	J. J.	65	♂	Early interstitial nephritis	Unchanged	9.5	25	2.5	13	185	+	+
7/21	D. S.	56	♂	Early interstitial nephritis	Unchanged	6.6	24	2.3	26	185	—	+
9/21	D. D.	52	♂	Early interstitial nephritis	Unchanged	8.7	30	3.6	30	100	+	+
8/3	C. M.	54	♂	Early interstitial nephritis	Unchanged	6.3	31	2.0	23	150	—	—
III												
1/ 6)										240)		
3/ 1)	L. P.	57	♂	Moderately severe chronic interstitial nephritis	Improved	8.0	80	4.8	0	170)	++	++
4/22)						4.9	17	2.9	10	170)		
5/21)	J. P.	34	♂	Moderately severe chronic diffuse nephritis	Improved	8.3	72	4.2	25	220)	+++	++
1/15)						5.3	21	1.9	42	145)		
1/28)	W. C.	40	♂	Moderately severe chronic diffuse nephritis	Improved	9.5	44	3.5	28	210)	++	++
IV						2.5	19	1.9	52	120)		
4/11	E. C.	50	♀	Typical fatal case of chronic interstitial nephritis	Died	22.4	236	16.7	0	210	++	Pus
3/23	T. D.	34	♂	Typical fatal case of chronic interstitial nephritis	Died	15.0	240	20.5	2-3	225	++	+
1/25	S. H.	37	♂	Typical fatal case of chronic interstitial nephritis	Died	14.3	263	22.2	0	220	++	+
4/15	J. W.	34	♂	Typical fatal case of chronic interstitial nephritis	Died	8.7	144	11.0	Trace	225	+	+

* Normal findings: uric acid from 2 to 3 mg.; urea nitrogen, from 12 to 15 mg.; creatinin, from 1 to 2.5 mg. per 100 c.c.
The symbol ♂ signifies male; ♀ signifies female.

In our studies[8] on the uric acid, urea and creatinin of the blood it was soon noted that high uric acids were frequently found wthout any other retention, while creatinin appeared to be retained only in the last stages of the disease. In comparing the concentration of these waste products in blood and urine, it was observed that the kidney was able to concentrate the creatinin 100 times, the urea eighty times, but the uric acid only about twenty times. In other words, it would appear that, normally, creatinin is the most readily and uric acid the least readily eliminated by the kidney, with urea standing in an intermediate position. From this it is logical to expect that the excretion of uric acid would be the first to be impaired, and in nephritis our blood studies appear to indicate that a retention of uric

of a high creatinin accumulation, the kidney is, apparently, never able to overcome.

Our blood studies show that many early cases of nephritis, probably of the interstitial type, give blood pictures in which the essential feature is the high uric acid. The urea and creatinin are frequently normal, though sometimes appreciably increased. As the condition of the cases of this type becomes more severe, the retention of urea increases, until we have high values for urea as well as uric acid. If improvement takes place, the concentration of urea gradually falls until the picture is that of the preceding group. If, on the other hand, the case goes on to fatal termination, the retention of uric acid and urea is followed by that of creatinin, the concentration of which may reach twenty times the normal.

As already noted, the rise in the concentration of the uric acid of the blood appears to be an excellent early sign of chronic (interstitial) nephritis.[9] The diagnostic value of the blood uric acid in comparison with

6. Mosenthal and Richards: Arch. Int. Med., 1916, xvii, 329.
7. Foster and Davis: Am. Jour. Med. Sc., 1916, cli, 49.
8. Myers and Fine: Jour. Biol. Chem., 1915, xx, 391. Myers and Lough: Arch. Int. Med., 1915, xvi, 536. Myers, Fine and Lough: Arch. Int. Med., 1916, xvii, 570. This paper describes the estimation of the uric acid, urea and creatinin in the blood. At the suggestions of one of us (M.), E. Leitz of New York has recently made a very simple and inexpensive colorimeter which may be used for these determinations.

9. Myers, Fine and Lough: Footnote 8.

other tests is well brought out in Table 2. It is obviously important in this connection to bear in mind the association of uric acid retention with gout,[10] although the retention here must likewise be ascribed to the same cause, namely, a lowered kidney permeability.

As a prognostic test the blood creatinin has been found of very great value. It is superior to the phenolsulphonephthalein test, since changes in the patient's condition are clearly shown, while the phenolsulphonephthalein test is continuously negative. Attention was called to this test nearly a year ago,[11] but we now have more than three times as many cases on which to report. All patients whom we have been able to follow for any length of time who had over 5 mg. creatinin to 100 c.c. of blood have died. Our observation on these cases, together with the phenolsulphonephthalein outputs, are summarized in Table 3. In this list it will be noted that only three (one patient has since died) of the patients having over 5 mg. remain alive, and these are patients who have been allowed to leave the hospital only recently. Only one of these patients, however, can be called improved.

Our experience with the ratio between the urea of the blood and urine according to the formulas worked out by Ambard and by McLean has been rather disappointing. In comparing the uric acid, urea and creatinin of the blood and the phenolsulphonephthalein of the urine with the index of McLean[4] in thirty cases, the index appeared to give no additional information over the blood urea with the possible exception of one case. In this case a blood urea nitrogen of 33 mg. was encountered with an index of 198. In the above thirty cases the indexes ranged from 3 to 342. It is quite possible that this is too small a number of cases from which to make deductions, although Addis and Watanabe[12] recently concluded that "The rate of urea excretion in man varies under physiologic conditions in a manner which cannot be explained by the concentrations of urea in the blood and urine." Dr. Watanabe has been kind enough to recalculate some of their data into terms of the McLean index, the results indicating that according to this formula the indexes on normal subjects may vary between 25 and 250, a rather wide variation.

The patients whom we have had an opportunity of studying have been largely patients suffering from chronic interstitial (or true) nephritis. The condition of the blood in parenchymatous nephritis (nephrosis) is in our experience very different from that of the interstitial type. In the parenchymatous form one finds only a moderately increased blood urea, but differing from the interstitial type; an increased concentration of chlorids is frequently present, as might be expected from an accompanying edema.

As is evident from dyspnea, many advanced cases of nephritis develop an acidosis, due not to an increased formation of acid substances as in diabetes, but to the impaired elimination of the normally formed acid substances. During the last two or three years we have been accustomed to ascertain the degree of this acidosis from the carbon dioxid tension of the alveolar air[13] or the hydrogen ion concentration of the blood. Van Slyke[14] has recently shown that the degree of this acidosis may be more simply and more accurately determined by ascertaining the carbon dioxid combining power of the blood plasma. For this purpose he has ingeniously devised a very simple apparatus. This instrument has been in continuous use in our laboratory for the past year. Normally the carbon dioxid combining power varies from 53 to 77 c.c. (corrected) per 100 c.c. of plasma. In nephritis it is generally somewhat reduced, 40 to 50, but may fall to as low as 25 shortly preceding death.[15] It would appear that in some cases the acidosis was a more important factor in the terminal symptoms than the nitrogen retention. As a guide to the treatment of the acidosis the determination has been found very valuable. One case may be mentioned. W. C. (Table 1, Group 3, Case 3) was admitted in coma with a carbon dioxid of 22. After an infusion of sodium bicarbonate, the patient quickly revived and on the second day showed a carbon dioxid of 58.

That many advanced cases of diabetes develop nephritis is a well-known clinical observation. In the early cases of diabetes there is a direct relation between the hyperglycemia and glycosuria, but this is certainly not true in cases of long standing with nephritis. It has been recognized for some time that hyperglycemia was present in many cases of advanced interstitial nephritis, though glycosuria was absent. The blood picture that we have observed in some cases

TABLE 2.—THE URIC ACID OF THE BLOOD IN CASES OF INCIPIENT INTERSTITIAL NEPHRITIS

Case	Age	Sex	Diagnosis, Remarks	Mg. to 100 C.c. of Blood			Phthalein, 2 Hrs. Output, per Cent.	Blood Pressure		Urine	
				Uric Acid	Urea Nitrogen	Creatinin		Systolic	Diastolic	Albumin	Casts
1. J. J.	65	♂	Interstitial nephritis	9.5	25	2.5	13	195	90	+	+
2. E. B.	46	♀	Fibrillation	9.3	14	2.9	44	120	90	—	—
3. D. D.	52	♂	Cirrhosis of liver, interstitial nephritis, chronic alcoholism	8.7	20	2.6	20	100	87	+	+
4. B. D.	25	♀	General edema	7.7	20	2.6	45	148	100	+	—
5. M. K.	49	♂	Carcinoma of stomach	7.5	16	2.2	50	150	90	—	+
6. D. S.	56	♂	Interstitial nephritis	7.1	16	2.0	28	185	110	—	+
7. A. R.	57	♂	Carcinoma of stomach, interstitial nephritis	6.8	20	1.8	60	140	80	—	+
8. H. L.	*22	♂	Pulmonary tuberculosis, tuberculosis of kidney	6.5	16	2.7	58	130	90	++	+
9. C. M.	54	♂	Hypothyroidism, interstitial nephritis	6.3	31	2.0	45	150	90	—	—
10. M. McA.	44	♂	Syphilis, interstitial nephritis	6.3	17	2.7	38	185	80	++	+
11. W. B.	71	♂	Chronic arthritis, arteriosclerosis, interstitial nephritis	6.1	12	2.4	65	145	80	+	+
12. E. H.	41	♂	Pericarditis, moderate alcoholism	5.6	13	2.1	45	150	65	—	—

That many advanced cases of diabetes develop nephritis is a well-known clinical observation. In the early cases of diabetes there is a direct relation between the hyperglycemia and glycosuria, but this is certainly not true in cases of long standing with nephritis. It has been recognized for some time that hyperglycemia was present in many cases of advanced interstitial nephritis, though glycosuria was absent. The blood picture that we have observed in some cases

10. Fine: The Relation of Gout to Nephritis, as Shown by the Uric Acid of the Blood, THE JOURNAL A. M. A., June 24, 1916, p. 2051.
11. Myers and Lough: Footnote 8.
12. Addis and Watanabe: Jour. Biol. Chem., 1916, xxiv, 203.
13. Very recently Marriott (The Determination of Alveolar Carbon Dioxid Tension by a Simple Method, THE JOURNAL A. M. A., May 20, 1916, p. 1594) has described a simple technic for carrying out this test, thus rendering it directly available to the clinician.
14. Van Slyke, Stillman and Cullen: Proc. Soc. Exper. Biol. and Med., 1915, xiii, 39.
15. Quintard and Fine: Unpublished observations.

of advanced diabetes is typical of interstitial nephritis,[9] that is, high uric acid values, frequently with moderate retention of urea. These patients had marked hyperglycemias, in one case 1.1 per cent., but were unable to secrete urines of high sugar content. Cases might be cited[16] with blood sugars up to 0.3 per cent. and above without glycosuria. The condition the clinician is endeavoring to treat by restricting the carbohydrate of the diet is the hyperglycemia, but the glycosuria is sometimes a very poor index to this condition. Since the determination of blood sugar may now be very simply carried out, the estimation of the sugar of the urine should be supplemented by the determination of the sugar of the blood.

COMMENT

Of the large number of methods used in the past few years to estimate the functional capacity of the kidney, we feel that the following are of practical use to the general practitioner: the phenolsulphonephthalein test, the determination of the fixation of the specific gravity and of nocturnal polyuria (an elimination of over 400 c.c. between 6 p. m. and 6 a. m. being an indication of renal involvement), and the estimation of the blood content of uric acid, urea, creatinin, sugar and carbon dioxid combining power. These tests are distinct contributions to medicine and have come to stay.

The use of renal test meals gives us much valuable information, but because they necessitate the careful weighing of foodstuffs and the exact collection and analysis of specimens of urine, their use will be largely confined to institutions.

The modern dietetic treatment of nephritis is based on the ability of the body to metabolize food stuffs and to eliminate their end-products; also on the permeability of the kidney to salt, water and nitrogen. By means of the newer methods of urine and blood analysis, the effect of a given diet can at once be determined.

It is obvious that in cases of salt, water or nitrogen retention the indications are to give either a salt-free limited fluid or low protein diet, as the case requires. In cases of nephritis with high nitrogen retention, an almost exclusively carbohydrate diet, sugar in lemonade, arrowroot and cornstarch puddings are given for a few days.

16. Myers and Bailey: Jour. Biol. Chem., 1916, xxiv, 147. This paper describes the method of blood sugar estimation.

The amount of nitrogen retention in the blood serves as a most excellent guide in the giving of protein. The use of a salt-free diet in cases of parenchymatous nephritis with edema and salt retention gives prompt results.

CONCLUSIONS

An increase in the uric acid of the blood would appear to be of considerable value as an early diagnostic sign of incipient nephritis.

The urea of the blood has been found very valuable as a guide to the treatment of moderately severe cases of nephritis, since any change in the patient's condition is quickly perceptible.

As a prognostic test the blood creatinin has been found of very great service, over 5 mg. to 100 c.c. having invariably proved fatal after the lapse of a comparatively short period of time. During the terminal stages of the disease the concentration of the creatinin gradually rises, reaching 15 to 30 mg. in most cases at death.

The determination of the carbon dioxid combining power of the blood plasma according to the method of Van Slyke is a valuable index to the acidosis of nephritis, from the viewpoint of both diagnosis and treatment.

In cases of advanced diabetes complicated with nephritis, the glycosuria or absence of glycosuria is a very poor guide to the hyperglycemia, since the nephritis has lowered the permeability of the kidney for sugar. In these cases the estimation of the sugar of the urine should always be supplemented by the determination of the sugar of the blood.

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TABLE 2.—THE PROGNOSTIC VALUE OF THE CREATININ OF THE BLOOD IN NEPHRITIS

Case	Blood Creatinin, Mg. to 100 C.c.	Phthalein, 2 Hr. Output, per Cent.	Termination
1. W. F.	33.3	...	Died
2. E. M.	28.6	0	Died
3. S. H.	22.2	0	Died
4. T. D.	20.5	2 to 3	Died
5. I. D.	20.0	0	Died
6. P. J.	20.0	0	Died
7. F. L.	18.9	0	Died
8. M. M.	17.8	...	Died
9. E. C.	16.7	0	Died
10. W. O'C.	16.6	Trace	Died
11. M. K.	14.7	.....	Died
12. K. K.	14.7	0	Died
13. J. H.	14.3	.....	Died
14. E. P.	12.7	0 to 1	Died
15. W. W.	12.5	0	Stationary
16. M. O.	11.1	0	Died
17. K.	11.1	0 to 2	Died
18. J. W.	11.0	3 to 1	Died
19. J. D.	10.7	0-5-4-3-6	Died
20. C. G.	10.0	0	Died
21. S. W.	9.1	0	Died
22. V. A.	8.3	6-4-2	Died
23. J. S.	7.4	.....	Died
24. W. G.	7.0	.....	Died
25. E. W.	6.7	5	Died
26. A. F.	6.1	9	Died
27. M. R.	5.9	3	Died
28. J. McC.	5.6	2-7-10	Improved
29. V. R.	5.5	.....	Died
30. M. N.	5.4	13-4	Stationary*
31. E. E.	5.3	10	Died
32. A. D.	5.2	.....	Died
33. T. K.	4.9	.....	Died
34. L. P.	4.8	0-10-21	Improved

* This patient has since died with a creatinin of 12.5 at time of death.

The Diagnosis of Venereal Diseases.—A recent report from the laboratory of the New York City Health Department shows the work that is being done in the examination of specimens from cases of suspected venereal infection during the first quarter of 1916. During this period there were 13,419 complement fixation tests for syphilis, of which 3,730 were positive and 8,042 negative, 1,112 doubtful, and 535 specimens received were not examined. There were 2,711 complement fixation tests made for gonorrhea, of which 248 were positive, 1,841 negative, 281 doubtful, and 341 received no examination. The specimens examined microscopically for gonorrhea numbered 2,055, of which 321 were positive, 1,220 negative, 410 doubtful, and 104 specimens received were not examined. The large number of negative reports indicates that physicians are taking advantage of the facilities the department offers in the way of diagnosis.

A COMPARATIVE STUDY OF TESTS FOR RENAL FUNCTION

PHENOLSULPHONEPHTHALEIN, NONPROTEIN NITROGEN AND UREA NITROGEN OF THE BLOOD, AMBARD'S COEFFICIENT OF UREA EXCRETION, AND THE TEST MEAL FOR RENAL FUNCTION *

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The term "renal function" is generally accepted to mean eliminative power of the kidneys. For clinical purposes, many workers in this field have regarded renal function as a unit, and the phrase "testing renal function as a whole" has become a by-word in medical phraseology. While such a conception of the kidney's acting as an entity, all of its component physiologic factors diminishing or increasing their efficiency synchronously, may have the advantage of simplicity, it does not accord with the known facts. It is a matter of routine observation that the diseased kidney may retain water, or salt, or urea, or phosphates, or sulphates, or any of the urinary constituents, and allow the remainder to pass freely. We know that the glomeruli and the various subdivisions of the uriniferous tubules are structures with widely varying physiologic functions and are affected to an unequal degree by different toxic substances. Extrarenal factors, such as secondary anemia, fever, cardiac failure, cystitis, prostatic disease, etc., are all mirrored in changes in the renal function which do not resemble one another in the least. Therefore, to speak of "testing renal function as a whole" is to set a false standard. Of the various tests for renal function, each has its own significance, and a greater insight will be obtained into the characteristics of kidney disease when physicians will no longer advocate one test blindly to the exclusion of all others, but will endeavor to interpret each one according to its significance. It is from this point of view that the following studies are presented.

INTERPRETATION OF THE INDIVIDUAL TESTS FOR RENAL FUNCTION

The phenolsulphonephthalein test is so widely used and its value so generally appreciated that it scarcely requires comment. Rowntree[1] and his collaborators have maintained that after intramuscular injection, a urinary excretion of the drug of 60 per cent. or more in two hours is normal and that "when the drug was continuously excreted in traces or not at all, a grave prognosis was to be given even without signs of uremia." Following these hints and the deductions from our own experience, the degree of impairment of renal function, as indicated by the various percentages excreted, have been set down in Table 1.

It is impossible to be dogmatic in regard to what constitutes the upper normal level of nonprotein nitrogen and urea nitrogen of the blood. Foster[2] found a maximum of 44 mg. of nonprotein nitrogen per hundred c.c. of blood in supposedly normal individuals. Tileston and Comfort[3] demonstrated 32 mg. after a meal in a heavy meat eater. Under ordinary circumstances, the maximum obtained by these authors was 25 mg., which agreed very closely with the results of Folin and Denis.[4] It would seem that, unless there be a very high protein intake, 30 mg. of nonprotein nitrogen per hundred c.c. of blood is a reasonable upper normal limit. The usual hospital bill of fare certainly does not furnish such a diet. Any value above 30 mg. in the present series of cases has, therefore, been regarded as indicating some degree of renal insufficiency. It is generally acknowledged that a retention of over 90 mg. of nonprotein nitrogen per hundred c.c. of blood indicates a very great increase, and it has been so considered here (Table 1). The urea nitrogen has been plotted out on the scale of impairment of renal function with the nonprotein nitrogen as a guide, keeping in mind the fact that in normal individuals the urea nitrogen constitutes about 50 per cent. of the total nonprotein nitrogen, while, with retention of the nitrogenous waste products, the percentage has a distinct tendency to increase (Table 1).

The upper normal limits of urea nitrogen have also been the subject of frequent experimentation. Schwartz and McGill,[5] after reviewing the extensive literature on the subject, consider urea nitrogen values above 12 mg. per hundred c.c. (0.25 gm. urea per liter) as abnormal. Myers, Fine and Lough[6] recently expressed the belief that 15 mg. of urea nitrogen per 100 c.c. of blood was the upper normal limit. McLean[7] demonstrated urea nitrogen as high as 23 mg. per hundred c.c. (0.5 gm. urea per liter) in normal individuals, but adds that within the limits of 14 to 23 mg. urea nitrogen per hundred c.c. of blood (0.3 to 0.5 gm. per liter) "a blood urea figure may be quite normal, or may occur with retention." It would seem,

TABLE 1.—SCALE OF DEGREE OF IMPAIRMENT OF RENAL FUNCTION AS INDICATED BY THE TESTS EMPLOYED

Degree of Impairment of Renal Function		Phenol-sulphone-phthalein, per Cent.	Nonprotein N of the Blood, Mg. per 100 C.c.	Urea N of the Blood, Mg. per 100 C.c.	Ambard's Coefficient of Urea Excretion	Test Meal for Renal Function					
						Night Urine		Variations in Sp. G. When the Highest Sp. G. is:			
						C.c.	Sp. G.	18	17-15	14 and 13	12—
Normal	0	60+	30—	15—	0.000—	400—	18+	9+			
Slight	+	50-60	31-45	16-27	0.091-0.115	401-600	16 and 17	8-5	6+		
Moderate	++	35-25	46-65	28-44	0.116-0.270	601+	15—	4—	5 and 4	6+	
Marked	+++	24-11	66-90	45-64	0.271-0.350	.....	.....	.....	3—	4 and 5	6+
Maximal	++++	10- 0	91+	65+	0.351+	.....	.....	.....	.....	3—	5—

* From the Medical Clinic of the Johns Hopkins Hospital.

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Rowntree, L. G., and Fitz, R.: Studies of Renal Function in Renal, Cardiorenal and Cardiac Diseases, Arch. Int. Med., March, 1913, p. 258.

2. Foster, N. B.: Functional Tests of the Kidney in Uremia, Arch. Int. Med., October, 1913, p. 452.

3. Tileston, Wilder, and Comfort, C. W., Jr.: The Total Nonprotein Nitrogen and the Urea of the Blood in Health and in Disease, as Estimated by Folin's Method, Arch. Int. Med., November, 1914, p. 620.

4. Folin and Denis: Jour. Biol. Chem., 1913, xiv, 29.

5. Schwartz, H., and McGill, C.: Blood Urea Determinations in Two Hundred and Eleven Cases, Arch. Int. Med., January, 1916, p. 42.

6. Myers, V. C.; Fine, M. S., and Lough, W. G.: Significance of Uric Acid, Urea and Creatinin of Blood in Nephritis, Arch. Int. Med., April, 1916, p. 576.

7. McLean: Jour. Exper. Med., 1915, xxii, 212.

therefore, that the consensus of opinion points to determinations yielding a urea nitrogen figure above 15 mg. in 100 c.c. of blood as revealing the possibility of nitrogen retention, which is at least worthy of closer investigation. For the other tests discussed here, absolute values for the normal may be given. For the nonprotein nitrogen and the urea-nitrogen of the blood, however, this is impossible because of the great influence dietary habits have on the level of these substances in the blood.

Ambard's coefficient of urea excretion expresses numerically the relation which exists between the concentration of urea in the blood and the rate of excretion of urea in the urine. It is calculated from the formula:

$$K = \frac{Ur}{\sqrt{D \times \frac{70}{P} \times \frac{\sqrt{C}}{\sqrt{25}}}}$$

In which K = The coefficient of urea excretion.
Ur = Urea grams per liter of blood.
D = Urea grams excreted in urine in twenty-four hours.
C = Urea grams per liter of urine.
P = Body weight in kilograms.
70 = Standard body weight in kilograms.
25 = Standard concentration of urea grams per liter of urine.

The formula is derived from Ambard's laws of urea excretion, concerning whose details the reader is referred elsewhere.[8] The normal coefficient usually ranges from 0.06 to 0.09. When the values rise above 0.09, some impairment of the power of the kidney to excrete urea is indicated. Inability of the kidney to eliminate urea in proportion to the concentration of the blood urea results in an increase in Ambard's coefficient. In a normal individual it will remain within the limits mentioned, no matter what the height of blood urea; in cases with impaired renal function, however, the kidney does not answer the diuretic stimulus of the blood urea adequately, too little urea is put out, and the result is a rising coefficient, whether the urea in the blood be high or low. The degree of impairment of renal function, as indicated by the various levels of Ambard's coefficient, are indicated in Table 1.

The test meal for renal function consists of the two hourly collection of urinary specimens during the day, while the patient is on a full diet, and of a ten to twelve hour specimen at night. No food or fluid is taken except at meal times. The collection of the night specimen is begun three hours after the evening meal. Under these circumstances, a normal test yields a maximum specific gravity of 1.018 or more, the specific gravity varies 9 points or more from the highest to the lowest, and the night urine is small in amount (400 c.c. or less) and of high specific gravity (1.018 or over). These criteria are the same as those originally demanded of a normal test, with the exception that a difference of 9 degrees between the highest and lowest observations has been called normal,[9] instead of 10. A lowering of the maximal specific gravity, a fixation of the specific gravity and a nocturnal polyuria are the signs indicating a diminished renal function. Table 1 gives the various degrees of impairment as indicated by the test meal for renal function, as compared to the other tests. The salt, nitrogen and other urinary constituents may be determined in these specimens, and valuable information may be obtained as to the ability of the body to excrete these substances. However, the simple procedure of measuring the volume of the urine and determining the specific gravity yields sufficient data to give an adequate idea of renal function in many respects, and the quantitative chemical determinations may be resorted to when more detailed information is desired.

In order to study the relation to one another of the evidences of impaired renal function obtained by these various tests, a somewhat arbitrary scale of four degrees of impairment — slight, moderate, marked and maximal — was determined on. The exact figures which the majority of experienced observers consider as indicating normal function, and these various degrees of subnormal function, were selected, and are shown in Table 1. The findings in over 200 patients were grouped in accordance with this scale.

A comparative table of this nature has heretofore not been seriously advocated. It has very distinct advantages in that it makes the judgment of laboratory findings very precise. However, it has its drawbacks in that it would tend to make the physician more mechanical in the interpretation of the facts laid before him and lead him astray, if the figures were not judged in connection with other clinical data. It is our belief that a scale indicating impaired function, as this one does, is a distinct aid when used correctly. In the first place, it calls attention without fail to impaired function whenever it is present, and it brings before the observer a distinct conception of the degree of involvement. In the second place, it enables the physician in charge to judge which functions are impaired and to what degree. Further study may show that this particular tabulation is erroneous in some respects. However, it is hoped that it, or a similar table, may be used as a standard by which to judge of renal function. Other tests for changes in diseases of the kidney might be plotted in on the same scale. It should be clear that no functional test can be used as direct evidence for the diagnosis of the anatomic or etiologic type of disease present, or even as a therapeutic guide, but only indirectly as an assistance to the experienced in arriving at a final judgment. A low hemoglobin percentage, for instance, gives an exact measure of the degree of anemia present, but tells nothing of its cause or of the exact treatment indicated.

TECHNIC EMPLOYED

The phenolsulphonephthalein test of Rowntree and Geraghty was performed according to the method outlined by these authors.[10] The procedure of Folin and Denis[11] was employed to obtain the figures for nonprotein nitrogen of the blood.

The method of Marshall[12] was used for the quantitative determination of urea nitrogen in the blood.

In ascertaining the figures for Ambard's coefficient of urea excretion, the same method for blood urea was employed; the urea of the urine was estimated according to Marshall,[13] the coefficient itself was calculated according to the original formula of Ambard.[14] The test meal for renal function followed the technic as previously laid down by one of us.[9] The name of this test has been changed from "nephritic test meal" to "test meal for renal function," as suggested by Dr. L. F. Barker, since it has been employed in many other conditions besides nephritis.

8. Ambard: Physiologie normale et pathologique des reins, Paris, 1914. McLean, F.: Jour. Exper. Med., 1915, xxii, 212.
9. Mosenthal, H. O.: Renal Function as Measured by the Elimination of Fluids, Salt and Nitrogen, and the Specific Gravity of the Urine, Arch. Int. Med., November, 1915, p. 733.
10. Rowntree, L. G., and Geraghty, J. T.: Jour. Pharmacol. and Exper. Therap., 1909, i, 579; The Phthalein Test, Arch. Int. Med. March, 1912, p. 284.
11. Folin and Denis: Jour. Biol. Chem., 1913, xiv, 29.
12. Marshall, E. K.: Jour. Biol. Chem., 1913, xiv, 283.
13. Marshall, E. K.: Jour. Biol. Chem., 1913, xv, 487.
14. Ambard: Compt. rend. Soc. de biol., 1910, lxix, 411, 506.

GROUPING OF THE CASES STUDIED

Observations on over 200 patients are recorded in this series. The results obtained in cases of anemia, whether primary or secondary, are considered separately at the close of the article. This is done because anemia presents a condition whose cause for diminished activity of the kidneys can be definitely associated with abnormalities of the blood, and which furnishes one of the most clear-cut examples of dissociated involvement of the various renal functions. That is, the ability to secrete a concentrated urine is remarkably diminished, while the other tests show only slight if any depression of renal activity. There are other diseases, such as diabetes insipidus, which show similar characteristics. The interpretation of renal function in these as well as other abnormal conditions is quite impossible at present.

The remainder of the material has been grouped in various ways, intended to bring out certain points which study of the material has yielded. Because of lack of space, it is impossible to publish the tables in full.

GENERAL COMPARISON OF ALL THE TESTS EMPLOYED

A glance at Table 2 establishes the following facts:

1. The nonprotein nitrogen and urea nitrogen indicate a slighter degree of involvement of renal function than the other tests.

TABLE 2.—DEGREE OF INVOLVEMENT BY THE TESTS AS COMPARED TO PHENOLSULPHONEPHTHALEIN, ACCORDING TO THE SCALE OF TABLE 1*

Degrees Variation from Phthalein	Nonprotein Nitrogen	Urea Nitrogen	Ambard's Coefficient	Test Meal
++	1 per cent.	1 per cent.	6 per cent.	15 per cent.
+	5 per cent.	10 per cent.	21 per cent.	35 per cent.
Same	48 per cent.	45 per cent.	47 per cent.	34 per cent.
−	32 per cent.	31 per cent.	23 per cent.	14 per cent.
−−	8 per cent.	10 per cent.	2 per cent.	2 per cent.
−− −−	3 per cent.	3 per cent.	1 per cent.	
−−−−	3 per cent.			
Total cases....	85	162	156	136

* In this table, + signifies 1 degree greater involvement than that shown by phenolsulphonephthalein, and − 1 degree less. All the cases observed except those with severe anemia are grouped together in this table.

2. Phenolsulphonephthalein and Ambard's coefficient tend to show an equal degree of impairment of renal function.

3. The test meal for renal function demonstrates a greater degree of depressed function than the other tests.

The same relations hold true for each type of case when this whole group is subdivided into the following classes: hypertensive cardiorenal disease, passive congestion, nephritis without hypertension, and miscellaneous, which includes cases of prostatic hypertrophy, cystitis, polycystic kidney, etc. The significance of these findings will be discussed in greater detail in the remainder of the article.

1. *The Nonprotein Nitrogen and Urea Nitrogen of the Blood, and Ambard's Coefficient.*—These three tests all determine the ability of the kidney to excrete nitrogenous waste products. Ambard's coefficient may indicate such an impairment of function even when the nitrogenous products in the blood are within normal limits.[15] In the present series (Table 3) this is readily observed. It also shows how slight increases in the blood urea and total nonprotein nitrogen figures may be revealed in their true light by Ambard's coefficient, many of them evidently being due to renal insufficiency, while others are not.

In all the cases quoted in this article, the basis of classification has invariably been the highest value for nonprotein nitrogen or urea nitrogen obtained. By these means, the dietetic influence has been in great part obviated. It has been demonstrated what a great part diet plays in influencing the level of nitrogenous waste products in the blood.[16] Our experience has led us to the same conclusion, as may be noted in Table 4.

TABLE 3.—COMPARISON BETWEEN THE DEGREE OF INVOLVEMENT OF RENAL FUNCTION, AS SHOWN BY THE NITROGENOUS PRODUCTS IN THE BLOOD, AND AMBARD'S COEFFICIENT

Degree of Impairment as Measured by Nonprotein Nitrogen and Urea Nitrogen	Total Number of Cases	Percentage of Cases Exhibiting the Given Degree of Impairment of Renal Function, as Indicated by Ambard's Coefficient				
		0	+	++	+++	++++
0	56	57	27	16		
+	64	17	28	50	5	
++	21	..	19	43	33	5
+++	9	..	..	11	56	33
++++	15	..	..	..	7	92

One of these cases is particularly noteworthy. The reduction of 145 mg. of nonprotein nitrogen to 32 mg. by dietary means is one of the most marked results of this kind thus far recorded. The partial data of this case are given in the accompanying chart.

The above and one other extrarenal factor must be borne in mind when blood nitrogen values are considered. This is the effect of an increased protein catabolism. It commonly occurs in the terminal stages of some forms of nephritis. That this condition in Bright's disease is not necessarily a rapidly fatal one is seen in this patient, who lived several months after these observations were made (see chart). Such a process may increase the blood nitrogen figures materially without signifying altered renal function as shown by the phenolsulphonephthalein or nitrogen excretion. It should, however, always be considered a serious omen, as may be gathered from those cases in whom we have observed it, all of whom have suffered a fatal issue either immediately or within a few months. Studies on these points are in progress at our clinic and will be reported in greater detail subsequently.

TABLE 4.—THE EFFECT OF A LOW PROTEIN DIET ON THE LEVEL OF THE NONPROTEIN AND UREA NITROGEN OF THE BLOOD

Before Low Protein Diet		After Low Protein Diet		Diagnosis
Nonprotein N Mg. per 100 C.c.	Urea N Mg. per 100 C.c.	Nonprotein N Mg. per 100 C.c.	Urea N Mg. per 100 C.c.	
26	17	16	7	Sec. Contr. Kid.
38	26	..	5	Chr. Diff. Neph.
38	..	30	..	Chr. Diff. Neph.
47	..	30	..	Chr. Diff. Neph.
97	61	22	15	Sec. Contr. Kid.
145	126	32	23	Sec. Contr. Kid.

15. Ambard (Footnote 14). McLean, F. C.: Clinical Determination of Renal Function by an Index of Urea Excretion, THE JOURNAL A. M. A., Feb. 5, 1916, p. 415.

16. Folin, Otto; Denis, W., and Seymour, Malcolm: The Nonprotein Nitrogenous Constituents of the Blood in Chronic Vascular Nephritis (Arteriosclerosis) as Influenced by the Level of Protein Metabolism, Arch. Int. Med., February, 1914, p. 224. Frothingham, Channing, Jr., and Smillie, W. G.: A Study of Different Nitrogenous Diets in Chronic Nephritis, Arch. Int. Med., February, 1915, p. 204.

The chart shows how in the first two weeks of observation, in spite of a negative nitrogen balance, the nonprotein nitrogen of the blood varied but slightly, and how it subsequently dropped to a lower level. Considering the fact that this patient was taking a low protein diet with a large caloric value in starches and fats, it is believed that these figures indicate a protein destruction. This is confirmed by the fact that during the third week the drop in the blood values was much more rapid than during the second period, although

TABLE 5.—RAPID CHANGES IN THE LEVEL OF THE NONPROTEIN NITROGEN OF THE BLOOD, DUE TO KIDNEY INSUFFICIENCY ALONE OR COMBINED WITH AN INCREASED PROTEIN CATABOLISM

Nonprotein Nitrogen of the Blood, Mg. per 100 C.c.		Days Between Observations	Diagnosis
First Observation	Second Observation		
35	426	23	Acute exacerbations of chronic nephritis; protein destruction
49	111	12	Chronic nephritis; bronchopneumonia; protein destruction
96	192	11	Chronic nephritis; uremia; protein destruction
127	304	8	Chronic nephritis; uremia; protein destruction
178	292	18	Chronic nephritis; uremia; protein destruction
63	222	54	Acute exacerbation of chronic nephritis; retention only
81	184	5	Mercury poisoning; anuria; retention only

the nitrogen loss was somewhat less. During this time, the protein destruction had evidently subsided. (The drop to 32 mg. of nonprotein nitrogen recorded in Table 4 occurred at a later period not included in the chart).

The last eight days of observation (see chart) indicate a marked retention of nitrogen without a corresponding increase in the urea nitrogen of the blood. This nitrogen was doubtlessly assimilated by the tissues. This series of events demonstrates how a nitrogen balance between the intake and the output in the feces and urine are not as valuable tests of the kidney's ability to handle a given amount of protein food as the blood determinations and Ambard's constant.[17]

TABLE 6.—COMPARISON OF DEGREE OF IMPAIRMENT OF FUNCTION IN SEVENTY-THREE CASES OF ALL CLASSES EXCEPT ANEMIA IN WHICH ALL THE TESTS WERE CARRIED OUT, EXPRESSED IN PERCENTAGE OF THE TOTAL FIGURES

Degree of Renal Involvement According to Scale	Phenolsulphonephthalein	Urea N of Blood	Ambard's Constant	Test Meal
0	18 per cent.	40 per cent.	32 per cent.	10 per cent.
+	45 per cent.	35 per cent.	22 per cent.	27 per cent.
++	12 per cent.	14 per cent.	25 per cent.	27 per cent.
+++	11 per cent.	4 per cent.	12 per cent.	7 per cent.
++++	14 per cent.	7 per cent.	9 per cent.	29 per cent.

Very rapid increments may occur in the nonprotein nitrogenous constituents of the blood (Table 5) caused either by kidney insufficiency alone or combined with abnormal protein catabolism. Such sudden changes may invalidate many of the attempts to formulate averages for blood figures in any given type of nephritis; they also explain the low nitrogen values found in some instances a few days before death in uremia.[2]

17. Mosenthal, H. O., and Richards, A. E.: Interpretation of Positive Nitrogen Balance in Nephritis, Arch. Int. Med., February, 1916, p. 329.

THE EARLY DIAGNOSIS OF IMPAIRED RENAL FUNCTION

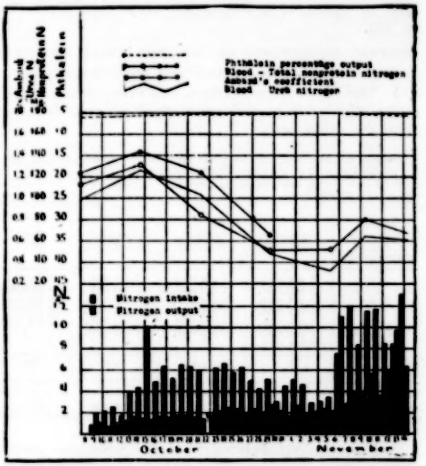
It has been shown (Table 2) that the test meal for renal function demonstrates a greater degree of depressed function than the other tests. This does not necessarily imply that it appears as the first sign of impairment. A better answer to this question can be obtained if only those cases (excepting the anemias) are compared in which all tests were carried out (Table 6).

Table 6 shows that:

1. The tests in order of their positive appearance are: the test meal, phenolsulphonephthalein, Ambard's constant, urea nitrogen of the blood.[18]

2. A maximal involvement is most frequently seen in the test meal, less frequently in the phenolsulphonephthalein test and least often in Ambard's coefficient.

The second consideration will be discussed under prognosis. The first point, that the test meal gives the earliest positive indication of renal damage,



Data from a case of secondary contracted kidney, indicating the processes of protein destruction and assimilation and their relation to tests of renal function.

confirms the observation made in Table 2. This fact admits of an explanation, which indicates very beautifully how in many cases the negative finding in the phenolsulphonephthalein and Ambard tests is more apparent than real. As others[19] have found, the present series contained some cases of chronic diffuse nephritis with an excessive phenolsulphonephthalein output (Table 7); besides these there were many instances of hypertensive cardiovascular disease exhibiting a similar phenomenon. All these patients also showed a very rapid elimination of urea, so that the figures for Ambard's constant were normal or subnormal.[20] These cases of overactivity in mild kid-

18. Christian and his associates have also found the test meal to be the most delicate indicator of renal function. Christian, H. A.: Am. Jour. Med. Sc., 1916, cli, 625.

19. Baetjer, W. A.: Supermeability in Nephritis, Arch. Int. Med., June, 1913, p. 593. Pepper and Austin: Am. Jour. Med. Sc., 1913, cxlv, 254. Sellards: Bull. Johns Hopkins Hosp., 1912, xxiii, 298.

20. These findings as well as similar ones in fever and hyperthyroidism will be discussed in full in a future paper by D. S. Lewis.

ney lesions have been referred by Schlayer and his associates[21] to the excessive response evoked in an intact organ by the irritation resulting from inflammatory processes. As the lesions advance, the renal parenchyma becomes more severely damaged and exhibits a subnormal activity to the pathologic stimulus. The stage of overactivity is characterized by phenolsulphonephthalein excretions and Ambard's coefficients, which appear to surpass even the normal criteria as signs of renal insufficiency. However, it has a different effect on the test meal, since the kidney irritability expresses itself in an excess of fluid excretion which has the tendency to result in a nocturnal polyuria, and a fixation as well as a lowering of the specific gravity. It is for this reason that the test meal is so frequently the earliest sign of an involvement of renal function.

PROGNOSIS

The relationship between tests of renal function and prognosis in nephritis has been found to be very uncertain. The extrarenal factors, cerebral hemorrhage, myocardial insufficiency, intercurrent infections, etc., have caused a fatal termination so frequently as to put a greater emphasis on the physician's clinical judgment than on the interpretation of tests for renal function alone. In certain patients, degrees of impaired kidney activity are found which are ordinarily considered incompatible with life. These as well as others who exhibit uremia with apparently fair functional kidney processes go far to show that uremia and renal lesions are not entirely dependent one on the other.

TABLE 7.—CASES OF CHRONIC DIFFUSE NEPHRITIS AND HYPERTENSIVE CARDIOVASCULAR DISEASE SHOWING A NORMAL OR SUPERNORMAL RESPONSE TO PHENOLSULPHONEPHTHALEIN AND AMBARD'S COEFFICIENT, WHILE THE TEST MEAL SHOWS SOME IMPAIRMENT OF FUNCTION

Diagnosis	Phthalein, per Cent.	Urea N of the Blood, Mg. per 100 C.c.	Ambard's Constant	Degree of Impairment Indicated by the Test Meal
Chronic diffuse nephritis	71	18	0.064	+
Chronic diffuse nephritis	78	11	0.054	+
Chronic diffuse nephritis	80	12	0.070	+
Chronic diffuse nephritis	70	8	0.068	+
Hypertensive cardiovas. disease	70	8	0.048	0
Hypertensive cardiovas. disease	63	12	0.050	++
Hypertensive cardiovas. disease	70	9	0.050	+
Hypertensive cardiovas. disease	85	9	0.039	0
Hypertensive cardiovas. disease	67	16	0.077	++
Hypertensive cardiovas. disease	81	15	0.060	+
Hypertensive cardiovas. disease	65	..	.....	++
Hypertensive cardiovas. disease	75	..	.....	+
Hypertensive cardiovas. disease	65	..	.....	+
Hypertensive cardiovas. disease	66	..	.....	++
Hypertensive cardiovas. disease	67	..	.....	+
Hypertensive cardiovas. disease	65	..	.....	++

The most striking example of this kind in our series is H. S.; diagnosis, polycystic kidneys. In December, 1914, the total nonprotein nitrogen of the blood was 118 mg., the excretion of phenolsulphonephthalein yielded only a faint trace in two hours (Ambard's coefficient, if determined, would undoubtedly have been very high), and the test meal showed a maximal impairment of function (maximal specific gravity, 1.011; variation from the highest to the lowest specific gravity, 1 degree; a night urine of 1,290 c.c.). Fifteen months later (March, 1916), the phenolsulphonephthalein and test meal were unchanged, the blood nitrogen was 112 mg., and Ambard's constant 0.67. At present one and one-half years after tests which indicated an extreme impairment of renal function, he is working at his office every day.

A high nonprotein nitrogen (above 90 mg.) or a high urea nitrogen (of 65 mg. or higher) has been found to be the most reliable prognostic sign. Of eighteen such patients, fourteen died in the hospital or shortly after leaving it; of the other four patients, one is still in the hospital in a precarious condition, one is the case of polycystic kidney referred to above, one is a case of mercuric chlorid poisoning with recovery, and the last is a case of secondary contracted kidney who has followed therapeutic directions so closely that he may almost be said to have outlived his day. It is clear to the physician coming in contact with these cases of nitrogenous retention that a sharp line can be drawn between those suffering with increased protein catabolism and those who are not. An example of this kind has been given in detail. This factor when present almost invariably foreshadows an unfavorable prognosis; a retention, on the other hand, not coupled with an abnormal degree of protein destruction, may do very well (as the case of polycystic kidney mentioned previously). In the earlier stages of nephritis, the nitrogen of the blood is very likely to lag behind the other tests (Tables 2 and 6) and it has been shown how Ambard's coefficient is more reliable under these circumstances as a test of renal function.

In nephritis, whether of the chronic diffuse or of primary contracted type, an Ambard's coefficient of 0.20 or higher has usually been associated with a fatal issue within a few months at the most. Of 87 patients with an index less than 0.2, 63 were traced and 15 died, 7 of uremia and 3 of cerebral hemorrhage. Of 36 patients with an index above 0.2, 30 were traced and 24 died, 12 of uremia, 9 of myocardial insufficiency, and 3 of cerebral hemorrhage. It is only to be expected that the patients with a higher Ambard's coefficient should show a more unfavorable prognosis. However, here, as in the case of other functional tests, an infallible guide to prognosis is not demonstrated. The test meal usually reaches a point of maximal intensity some time before the other tests. Uremia, or death from some other cause, may occur at these periods, and thus lend an aspect of greater prognostic importance to the test meal than it actually possesses. It may be used as a valuable guide to prognosis in conjunction with the other procedures, but an opinion of maximal impairment of function should not be given without them.

The phenolsulphonephthalein test in this series has yielded results which have not varied from those reported previously.[22] An output of less than 10 per cent. has usually, but not invariably, warranted an utterly bad prognosis; occasional instances of death from uremia have taken place with an excretion of the drug in the neighborhood of 50 per cent.

EXAMPLES OF "DISSOCIATED" RENAL FUNCTION

Up to the present, the most constant examples of this kind have been found among the anemias. A few of the results are given in Table 8. Case 1 typifies the test meal result in a case of severe anemia: a marked fixation of specific gravity at a low level, and a nocturnal polyuria, indicating a maximal degree of functional involvement. After transfusion, the specific gravity rises, but is still markedly fixed. As the blood returns to normal, the test meal tends to resume a normal curve (Case 2). Under ordinary circumstances the low fixed specific gravity is characteris-

21. For a summary of these views, see Schlayer: Beihefte z. med. Klin., 1912, viii, 211.

22. Thayer and Snowden: Am. Jour. Med. Sc., 1914, cxlviii, 781.

tic of anemia with a hemoglobin of less than 40 per cent. If the anemia persists over a long period, such results are obtained even when the hemoglobin assumes a higher level. This fact, coupled with the progressive diminution of phenolsulphonephthalein in Case 4, would indicate that anemia in itself may have a harmful effect on the kidney.[23] Cases 3 and 4 are examples of complete dissociation of function, the blood urea, Ambard's coefficient and phenolsulphonephthalein indicating only a slight or no impairment of function, the test meal a maximal one, whereas, in Cases 5, 6 and 7, with higher percentages of hemoglobin, the test meal reveals a slight or moderate involvement, as compared to the normal or slightly impaired state of the other tests.

The causes for extreme variance between urea nitrogen and nonprotein nitrogen of the blood and the other renal functional tests have been discussed. These tests are comparatively simple in their interpretation, and illustrate what great advances can be made when other problems can be attacked from a rational pathologic physiologic basis.

Occasionally cases are found in which there is extreme divergence of some of the tests, as in the following: In a woman, aged 37, the phenolsulphonephthalein excretion was 45 per cent. Ambard's coefficient 0.142, the nonprotein nitrogen of the blood a significance apart from the others, comparison according to this method is an extremely valuable aid in the treatment and prognosis of diseases of the kidney.

2. The level of the nonprotein and urea nitrogen of the blood must be estimated largely as the resultant of three factors—kidney efficiency, diet and protein destruction. In judging of prognosis, when these substances are high in the blood of nephritics, due regard must be given as to whether their accumulation is brought about by retention alone or through retention coupled with protein destruction. The former offers a comparatively better prognosis than the latter.

3. The coefficient of Ambard is a better method of determining the ability of the kidney to excrete urea than the level of this substance in the blood.

4. The progress of renal disease is probably followed most minutely by means of the phenolsulphonephthalein excretion and Ambard's coefficient, as these tests furnish figures in which even small variations are of significance.

5. The test meal for renal function, of the tests employed, gives the earliest indication of diminished kidney efficiency. It likewise reaches the maximum degree of impairment before the others.

6. Each test for renal function covers only a limited range of the kidney's activities. It is, therefore,

TABLE 8.—THE RESULTS OF TESTS FOR RENAL FUNCTION IN PRIMARY AND SECONDARY ANEMIAS

Case	Phthalein per Cent.	Ambard's Constant	Urea Nitrogen Blood, Mg. per 100 C.c.	Test Meal for Renal Function									Hb.	Red Blood Cells	Diagnosis
				Night Urine		Sp. G. in the Two Hourly Day Specimens									
				C.c.	Sp. G.										
1	..	....	..	430	12	..	11	12	12	11	12		25	1,088,000	Pernicious anemia
				490	18	16	17	18	17	16	18		55	2,444,000	After transfusion
2	..	....	..	520	23	17	21	25	20	22	13		95	4,028,000	Pernicious anemia; splenectomy; repeated transfusions
3	55	0.10	13	960	09	09	08	09	10	10	10		52	2,816,000	Secondary anemia for longer than 9 months
4	73	....	..	1,250	10	14	10	10	10	11	11		29	2,464,000	Secondary anemia for long period
	42	0.04	6	295	10	09	10	09	10	09	10		50	2,320,000	One year later
5	54	0.09	14	415	14	..	22	25	15	19	12		50	2,000,000	Primary anemia
6	54	0.06	14	455	21	16	16	17	18	18	18		48	1,960,000	Primary anemia
7	46	0.06	10	740	14	22	16	18	16	15	11		40	1,880,000	Secondary anemia

17, the urea nitrogen 9, and the test meal revealed a maximal involvement, as indicated by a low, fixed specific gravity. On first sight, this might be supposed to be a case of diabetes insipidus, as indicated by the low specific gravity and very moderate polyuria. However, such patients do not have a diminished phenolsulphonephthalein excretion,[24] and closer investigation of the nitrogen excretion, as suggested by a moderately impaired Ambard's coefficient, revealed the fact that the maximal involvement indicated by the test meal in its low fixed specific gravity was present because this individual did not have the power to concentrate nitrogen above 0.2 per cent. The salt output was much better than this.

Such cases illustrate how each test has its own significance, which, if thoroughly appreciated, may lead to marked improvement in therapeusis.

SUMMARY

1. A scale of impairment of renal function is proposed, according to which the tests may be measured. Such a graduation calls to the attention of the clinician the relative degree of involvement as shown by different procedures. Inasmuch as each of them has a mistake to speak of any test as measuring renal function as a whole. The aim should be to develop a proper interpretation of the old tests and easily applied new ones, in order to obtain a true guide to the treatment of diseases of the kidney.

23. Cases of anemia with serious functional disturbances of the kidney have been reported by Tileston, W., and Comfort, C. W., Jr. (Footnote 3).

24. Fitz, R.: A Case of Diabetes Insipidus, Arch. Int. Med., November 1914, p. 706.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. FOSTER, CHACE AND MYERS, AND MOSENTHAL AND LEWIS

DR. HENRY ASBURY CHRISTIAN, Boston: Dr. Foster has given us a very valuable analysis of the various types of uremia, one which I am sure will be helpful not only in a better understanding of the condition but also one that will give us a better idea of how to treat nephritic cases when confronted by the picture of uremia belonging to one of these various types. Dr. Chace has dealt chiefly with one method of testing renal function and his results are of decided value in comparison with other methods. Dr. Mosenthal has made comparisons of several methods and has drawn certain conclusions. This fact stands out in the symposium, that from the various methods we may get various results and we meet with cases in which we get individual variations from anticipated results though usually results from different methods agree very well. The important thing is that unless we apply more than one method we will miss evidences of disturbed renal function in some cases. The results of the studies we have conducted at the Peter Bent Brigham Hospital in Boston are analogous to those of Dr. Mosenthal in regard to the

relative results of the several tests. Like Dr. Mosenthal, we have come to think that Ambard's coefficient is of more value than the urea nitrogen in the blood. McLean's method of expressing the relationship between the urea in the blood and the urea in the urine is better in our opinion than the Ambard method. We have in our work come to the conclusion that in the determination of the total nonprotein nitrogen no more light is thrown on renal function than by the determination of the urea nitrogen in the blood. This latter determination is part of the data required for the McLean index or Ambard coefficient and so adds no extra work. In addition, the dietary test as outlined by Dr. Mosenthal is of value particularly in the early cases of nephritis in that it will show disturbances at a period before the phthalein, urea nitrogen or other tests will. The results obtained with the dietary test are of great value but chiefly in the early stages of nephritis. In the later stages, however, it gives little additional information to that obtained from the phthalein test, the blood urea and the Ambard or McLean index. This is due to the fact that it shows its maximum effect relatively early in the nephritis and in the late stages changes but little with progress of the lesion.

DR. L. F. BARKER, Baltimore: I should like to emphasize two points: First, the kidney behaves differently as regards different substances. If we wish to know in a broad way what the renal function is, we must test the power of the kidneys to excrete several different substances. This requires much work. For instance, the chlorids may be retained by kidneys that are able to excrete nitrogen well, and *vice versa*. Second, the kidneys begin to eliminate certain substances as soon as they appear in the blood, whereas other substances must reach a certain degree of concentration in the blood before the kidneys begin to eliminate them. Thus urea is a substance that is at once given out. On the other hand, the chlorids must reach a certain degree of concentration in the blood before the kidneys start excreting chlorids—the so-called threshold of chlorin excretion. The chlorids may fail to appear in the urine in pneumonia; the reason is that the blood-concentration in chlorids falls below the threshold of excretion. We must, I think, pay more attention to such excretion-thresholds.

What may the general practitioner use as tests of renal function? Of the several tests referred to there are two that are especially advantageous: First, the renal test diet as modified by Mosenthal is simple and easy to apply. The urine is collected every two hours. Even if we determine only the quantity and the specific gravity of each specimen thus obtained we can draw valuable inferences regarding the ability of the kidneys to excrete a concentrated urine and regarding the "fixation of the specific gravity" or a so-called hyposthenuria. Second, the phenolsulphonephthalein test is a valuable and practical test, especially for the surgeon who desires to know whether the renal function is good enough to permit him to perform an operation. If the general practitioner would apply these two tests in special cases he would reap the many benefits derivable from the studies of renal function as far as they have yet gone.

DR. ALBION WALTER HEWLETT, Ann Arbor, Mich.: The tests that have been discussed give the same sort of information concerning the function of the kidney and the question arises as to which is the most easily performed and is at the same time reliable. As between the blood urea and phthalein tests we have found the former a more accurate indication of serious renal damage. The phthalein test, however, is the more easily performed and is, as a rule, sufficiently accurate. The information given by such tests is of great value in prognosis and similar information cannot be obtained by the usual urinary examinations. Dr. Foster has pointed out that in one type of uremia the symptoms are due to a retention of urinary products in the body. In our experience this is the commoner type of uremia. In order to determine what rôle, if any, urea itself plays in producing the asthenic symptoms present in this toxemia, Gilbert, Wickett and myself took large quantities of urea by mouth and raised the urea in our bloods to 200 mg. per 100 c.c. or over. When the urea in the blood exceeded 160 mg. asthenic symptoms occurred. There was no rise of blood pressure and no loss of appetite. From these experiments we are inclined to believe that urea itself is responsible for some of the manifestations of this type of uremia.

DR. H. J. LEHNHOFF, Lincoln, Neb.: It appears to me that the result of this experimentation depends on a certain number of variables of the majority of which we have no knowledge and of even more of which we have absolutely no control. Some of these known variables might be illustrated by chronic infections, slight temperature elevation, conditions of the blood, abnormalities of the internal secretions, etc. These variables have an influence and I do not believe we should look on these abnormalities as being absolutely results of kidney pathology alone.

DR. NELLIS B. FOSTER, New York: I did not refer to Dr. Hewlett's experiment on himself as I believed he would speak of it. If he had sought my advice regarding doing it on himself, I would have told him not to do it, although it is an experiment I have wanted to see done. According to my notion, such amounts of urea would be dangerous should the kidney function be imperfect, but I rather doubt that urea is the sole factor productive of symptoms with the asthenic type of uremia.

DR. A. F. CHACE, New York: General practitioners wish to know those tests which are of practical value and those which are of academic interest. The examination of the blood requires only from 1 to 10 c.c. of blood and is comparatively simple. The advantages of these tests are that the physician does not have to pay attention to prepared diets and to specimens of urine carefully collected. I wish to recommend as practical tests the estimation of the uric acid, creatinin, sugar and the CO_2 combining of the blood.

DR. HERMAN O. MOSENTHAL, Baltimore: A very important point is the relation of extra-renal factors to kidney function. When we speak of renal function we mean the eliminative power of the kidney. This is dependent not only on the condition of the kidney itself, but likewise on the almost innumerable other factors which may influence the activity of this organ, such as the food intake, the metabolic activities of the body, the composition of the blood, the blood pressure, the rate of blood flow, fever, etc. It is necessary to recognize the fact that renal function is frequently as dependent on the changes which occur in the heart, the gastro-intestinal tract, the blood, etc., as it is on changes in the kidney itself. It may be the appreciation of this fact that has led clinicians to apply themselves to the study of function rather than to the pathologic anatomy of kidney lesions. In taking up studies of this kind, we are working with a twofold end in view: first, to obtain a greater insight into the patient's condition, and thereby to aid therapeusis, and, second, to increase our knowledge of the physiologic and pathologic-physiologic activities of the kidney. Contributions of great value have been made by the clinician to our knowledge of the functions of the thyroid, as well as other organs, by these means, and it is hoped that the same may be accomplished for the kidneys.

Metchnikoff and Buttermilk.—The lamented death of Professor Metchnikoff recalls the furore for the lactic acid bacillus which one of his papers created. Macaulay, in a famous passage, says: "We know no spectacle so ridiculous as the British public in one of its periodical fits of morality." The same public in a fit of new-found panaceal therapy affords a spectacle only slightly less ridiculous. Metchnikoff was the innocent cause of one of these. For several months one heard of nothing but the Bulgarian bacillus. The bacillus shared with Mr. Lloyd George's budget the honor of monopolizing the conversation at the dinner tables of the great. He dominated Belgravia, frolicked in Fulham, and bestrode Birmingham and the whole of the British Isles. Whether he did any good to any one except the chemists and the purveyors of milk there is some reason to doubt. That he himself, or a colorable imitation of him, which was put on the market by the unscrupulous, did a great deal of harm is quite certain. But the harm done was mostly to the self-prescribers or to those introspective idiots who allow themselves to be treated by their lady friends. It was therefore not great.—*Medical Press and Circular.*

THE RÔLE OF THE ANTEPOSED UTERUS IN THE CAUSATION OF BACKACHE AND PELVIC SYMPTOMS *

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The assumption of the upright position by woman has proved a doubtful experiment as far as her pelvic organs are concerned. They have been unable to satisfactorily accommodate themselves to this attitude and the fight for their correction is still on. The discussion of the correct position of the womb has long ago ceased to be confined to the medical profession and has become a topic of live conversation among the female laity. Every ache and pain from eye strain to sciatica will be promptly accounted for in a woman's mind, once it is ever suggested to her that her "womb is tipped." What more distressing condition can a woman imagine than that her most precious organ is lying askew? How surely, once the suggestion is received, will the woman hurry to the physician for confirmation or denial of the condition! On the answer she receives will depend, in a large measure, the health, mental and physical, of the patient.

Recognizing the fact that woman has assumed the upright position and that in consequence the uterus, under all conditions, is but poorly supported mechanically, the significance of the various positions in which we find the organ must be studied with care, and treatment directed to the relief of only those symptoms which can be proved to be caused by the position found.

Generally speaking, one position only of the uterus is recognized as a cause of low backache and pelvic drag, and that is the retroposition of the fundus. If the fundus is found to be forward in the pelvis the cause for the backache and pelvic symptoms is sought for in the sacro-iliac joints, in back strain and in the constipated bowel. Hundreds of patients are seen in whom the fundus is in third degree retroposition and yet they have no backache whatever, and an equal number may be found in whom the fundus is forward and yet they have all the clinical symptoms of a retroposition. It was this seeming paradox which led me to undertake the studies which form the basis of this paper.

The chief supports of the uterus are those of its cervical portion, namely, the lower part of the broad ligaments and the pelvic floor. If the round ligaments and the upper parts of the broad ligaments are severed, there will result but little if any change in the position of the uterus as a whole. There may easily result rotation of the fundus with the cervical portion acting as an axis, but there will be no resulting descent. As it is the descent, and descent alone, which causes the drag which produces symptoms, the position of the fundus, whether forward or back, may be disregarded as a factor in the production of these symptoms. We must focus our attention on the amount of descent, the relative position of the uterus as a whole, if we would determine whether that organ is the cause of the drag or not.

The frequent failure of a suspension of a retroposed fundus to relieve patients of their symptoms of low backache, and the persistence of symptoms of backache and pelvic drag after strapping the back, applying corsets and belts, etc., in patients in whom the fundus remains forward, led me to conduct a series of experiments and investigations to try to remedy these failures.

The first of these investigations were carried out in my office and clinic. In every patient examined who complains of backache and lack of support, a careful note is made as to the position of the uterus as a whole in the pelvis. First I note the relative position of the cervix to the symphysis pubis and the ischial tuberosities, paying no attention whatever to the forward or backward position of the fundus. The extent of the anteroposterior movements is noted, in other words, the amount of posterior descent of the cervix. In speaking of descent I mean only the posterior descent toward the coccyx and in no way the rotation with descent toward the outlet, a condition which forms an entirely different class of cases. The stability of the lower part of the broad ligaments, the paracervical tissues and the uterosacral ligaments are tested by grasping the uterus between the examining hands and moving it as far as possible up behind the symphysis and backward toward the coccyx. By this maneuver I can frequently reproduce temporarily the ache and drag of which the patient complains. This is always a desirable feature in any diagnostic work in which pain is a symptom.

From the examination of a large series of cases the amount of posterior descent is found to vary considerably. I then place vaginal tampons in such a position that the uterus as a whole, and not simply the fundus, is forced well forward, up back of the symphysis, in the position where a high suspension will hold it. These tampons are allowed to remain for forty-eight hours, during which time the patient is instructed to keep about her normal activities, walking, dancing, or whatever she pleases. At the end of forty-eight hours the patient reports to me the result of this experiment. If the backache and drag have been relieved, I feel sure that a suspension will give permanent relief. If the backache is not relieved, then some other cause for the same must be sought, a cause outside of the position of the uterus in the pelvis. By this means, many cases of sacro-iliac pain and back strain are clearly differentiated from low pain due to uterine descent.

As a further means of investigation, undertaken with the purpose of finding out the real cause of the pain due to uterine descent, careful exploration is made in the case of every patient operated on. As soon as the abdomen is opened, the intestines are gently pushed up out of the pelvis and a careful inspection of all pelvic structures made. Whether the fundus is turned forward or backward, the uterus as a whole will be found to be far down in the pelvis, the fundus sometimes lying below the pubic arch, although there has been no descent toward the outlet. The most striking picture, however, is that furnished by the fulness and congestion of the ovarian veins, in case the uterus descends in the manner described, the chief pull coming on the infundibulopelvic ligament, which is composed of nothing more than the two layers of sensitive parietal peritoneum enclosing the ovarian vessels. This so-called ligament stretches around the sides of the pelvic wall and originates at a point posteriorly, practically corresponding to the location of the sacro-iliac joints. Now what happens? The ovarian veins are long veins emptying into the renal vein and vena cava, high in the abdomen and contain no valves. They return the major part of the blood

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

from the pelvis and are poorly equipped to carry on this extensive circulation. On careful examination, it is found that these veins are full and congested up to the point where they cross the pelvic brim, but above that point are nearly flat and empty. With these veins then in clear sight, the descended fundus is grasped and slowly lifted out of the pelvis to a point where the suspension is to carry it. The following results are evident: The ovarian veins, from the uterus to the pelvic brim, are immediately emptied, and the stretched parietal peritoneum of the infundibulopelvic ligament is relaxed. In other words, the pull on the parietal peritoneum as it swings around the sides of the pelvis is overcome.

It has been repeatedly demonstrated that in cases in which the fundus is retroverted, but in which the cervix is well held up, no such congestion of the ovarian veins takes place and there is no pull on the parietal peritoneum. Replacing the fundus in these cases will have little or no effect on the parietal peritoneum or the ovarian circulation. It is not the retroversion of the fundus per se which causes the symptoms. That the two may be coexistent, that is, that the retroposed fundus may be accompanied by a cervical descent, often is true. It is equally true, however, that the anteposed fundus plus cervical descent is accompanied by congestion of the ovarian vessels and peritoneal drag.

It becomes necessary then for us to take into consideration in examining these cases only one factor, the posterior descent of the cervix. Whether the fundus is forward or backward plays but a minor part in the production of symptoms. If the cervical supports have given way, symptoms will be produced for which a suspension will give relief, whether we have a retroposed or anteposed fundus.

As a result of these studies I have been led to suspend many anteposed uteri in which I found descent present accompanied by the classical symptoms of a retroposition, and with excellent results.

It is far from my purpose to advise promiscuous suspension of every uterus, whether found forward or backward. On the contrary, the differentiation of cases needing suspension has become much more exact and only those cases which can be proved before operation to require suspension are operated on, and this proof must be forthcoming from the patient as well as from the surgeon. On the other hand, I no longer hesitate to suspend a uterus simply because there is no retroposition of the fundus, and I do hesitate to suspend a retroposed uterus simply because it is found on examination to be retroposed. Actual proof that the condition needs correction must first be forthcoming.

It is a marked feature of these cases of cervical descent that the patients have the same symptoms when lying on their back in bed as when standing upright. This is necessarily so, for there is the same amount of descent and consequent ovarian congestion in this position. It is found that many of these patients sleep lying flat on the abdomen, a position which in itself corrects the deformity temporarily and gives comfort.

I would like to cite a typical case:

Mrs. B., aged 41 years, having three children, complained of low sacral backache and pelvic drag. She had not been able to sleep on her back for five years on account of this backache, which was fully as severe when lying in this position as when on her feet.

Examination revealed a lacerated cervix and moderately relaxed perineum. The fundus was of normal size and anteposed, but the organ as a whole was in marked posterior descensus in the pelvis. The physician who referred the case urged that no suspension be performed, as the fundus was never retroverted. The patient had, however, every symptom of a retroversion and I urged a suspension in addition to the repairs, and this was accepted. On opening the abdomen the descent and congestion were clearly demonstrated and the emptying of the ovarian veins and relief of peritoneal drag was accomplished.

From the moment the patient came out of ether the backache was completely relieved, and she has had no return of it. Had we disregarded the descent of the anteposed uterus and performed only the plastic operation this result would not have been obtained.

In a second case, a woman, 26 years old, who had never borne children and on whom no plastic operations were required, the anteposed but descended uterus was suspended with absolute relief.

In one striking case I was led, by the urgent request of the family physician, to perform only the plastic operation because the fundus was in anteposition and the physician felt a suspension to be unnecessary. This patient was not relieved in the least of her backache and pelvic symptoms, although she had been assured by her physician that her womb was not "tipped" and that after a repair of the lacerations her backache would disappear.

This paper forms a plea for the recognition of a class of cases hitherto neglected or misunderstood, namely, the anteposed uterus in descent, causing the symptoms of retroposition; a plea also for the careful differentiation of cases which need suspension before any operation is performed. We must not hesitate to suspend an anteposed uterus once it is proved that the organ is in descent and is causing symptoms; neither is it necessary to suspend a retroverted fundus simply because it is found to be lying in this position, when actual proof is not forthcoming that the retroposed fundus is at the bottom of the trouble. A fundus may lie in third degree retroposition and the cervix be well held up without causing the slightest backache or pelvic drag.

By careful attention to this detail only selected cases will be suspended and relief will always follow.

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ABSTRACT OF DISCUSSION

DR. CHANNING W. BARRETT, Chicago: This paper introduces the subject which bears on the general supports of the uterus throughout the relation of the intra-abdominal pressure on its ligaments and the pelvic floor, etc. It deals more particularly with the subject of the anteposed uterus which still has descent. It has long been recognized that the retrodisplaced uterus has a more or less marked degree of descent, but the subject of the anteposed uterus having marked degrees of descent is not well recognized. Dr. Hutchins points out the difficulties in reference to the upright position. We would hear little of the question of malposition of the uterus if the human had retained the horizontal position and the pelvic outlet, its high point in the abdominal cavity; but, as the animal assumed the upright position, there had to be a change in that position, and that change has brought about certain necessities for support. One of the changes has been the development of a pelvic floor with little or no support. Another change is that of the position of the uterus from in line with the vagina to at less than right angles, which position has very much to do with the descent. Therefore, we would lay more stress on the question of uterine displacement than does Dr. Hutchins, because even though we may have uterine dis-

placement without displacement backward, at a given time one of the principles of support of the uterus is interfered with, that of the uterus being out of line with the vagina. As soon as the uterus is displaced backward it gets into line with the vagina and brings about descent. No matter how important it is from the standpoint of support that the animal be in the horizontal position it has become the habit of the human to be in the upright position. In the correction of the conditions we must aim to simulate Nature's provisions for support of the pelvic organs. We must have a good pelvic floor. As a rule, descent is concerned with some weakness of the pelvic floor, not necessarily weakness from childbirth, but from the tendency of the human to have a pelvic floor like that of the lower animals, from which the human has developed. We must correct that condition of the pelvic floor; we must have the uterus out of line with the vagina. I would be much more inclined to correct retrodisplacement than Dr. Hutchins indicates in the treatment of descent.

Dr. Albert Goldspohn, Chicago: The anteposed uterus is one located too far forward, too near the symphysis pubis. It may stand high or low, and its long axis may be in a normal direction. That is one thing. Another is anteversion, which is a normal status, but may exceptionally become pathologic as the result chiefly of inflammatory complications. Which of these does the essayist mean? Anteflexion is a deformity and not a displacement. The main trend of the argument I understand to be that it is descensus uteri that causes the symptoms and not version of it either forward or backward. In that I can agree only partially. The symptoms produced by any kind of uterine displacement, per se, independent of inflammatory complications, are brought about chiefly through the resulting embarrassment in the venous circulation, by traction and by torsion of these vessels. The traction the doctor would relieve but the torsion he would ignore. Is that permissible? Bernhart Schultze many years ago, by very careful and laborious observations, first among the dead and then on the living, made clear the rules suggested by the anatomy of the parts, that anteversion is the normal position of the uterus, because the broad ligaments that carry nearly all these vessels are not cords, but flat, web-like structures set at such an inclination forward from the vertical axis of the body, that the uterus between them must likewise assume such a forward inclination if the broad ligaments are to preserve their normally flat shape, that when the uterus turns over backward, half of a circle or more, the web of broad ligaments being only from about 7 to 10 cm. long and nearly as wide, is twisted into a cord and a corresponding embarrassment results to the veins that do not, like the arteries, have a force pump back of them. This anatomic fact is not taken into account in the argument of the essayist. We must relieve and correct not only the displacements of the uterus which induce traction on the veins, but also those which inflict torsion of them if we would be successful; for embarrassed veins means harassed nerves here as elsewhere in the body. I heartily agree with the doctor in the proposition to suspend the uterus innocently and efficiently (by means of the round ligaments) and in a higher plane than is assumed by those who would have it remain necessarily within the small pelvis.

Dr. Walter P. Manton, Detroit: I agree heartily with Dr. Hutchins. For many years I have been carrying out a somewhat similar method of treatment. It takes only a very minor degree of downward displacement often to produce very severe symptoms in these cases of anteflexed or anteposed uteri, and consequent venous congestion. I do not quite agree that all of these cases need operative treatment. If this fraction of a degree of descensus can be relieved, you have obtained the necessary results, and I have found that in many cases the good old-fashioned Smith or Hodge pessary, properly adjusted, will give as good results as shortening the round or uterosacral ligaments.

Dr. E. E. Montgomery, Philadelphia: Too much attention is frequently paid to the displacement rather than to the complications associated with it. In the great majority of cases, whether the displacement be anteposed or retroposed, the condition does not cause symptoms unless complicated with some inflammatory condition. This inflammatory condition may, of course, be induced as a result of protracted congestion from the displacement. As has been mentioned the veins, being thin walled, are more readily susceptible to interference with the passage of blood through them by some disarrangement of the position of the organ. Many of these cases, however, can be relieved without resort to operative procedure by having the patient assume the knee-chest posture and practicing deep breathing, thus allowing the blood to be aspirated out of the pelvis during the act of deep inspiration. Many patients are relieved by such palliative measures, by care, exercise and the lessening of intra-abdominal pressure by proper clothing, etc. These, it seems to me, are important considerations in the treatment of these forms of discomfort.

Dr. J. H. Carstens, Detroit: Always this is a very complicated affair. If you read all the different operations advocated to relieve this condition it shows that we have a very complex affair to deal with in most of these cases. One will persistently pursue certain methods of operation; another strongly advocates some others. For instance, formerly every one insisted on the perineum being restored, that that was at the bottom of the whole trouble, and that the restoration of the perineum was the great operation. And it did relieve some cases, but others it did not. I have seen cases in which the perineum was torn into the rectum for two inches and women running around with that condition for ten years with the uterus not displaced, and no trouble with the uterus. This proves that the perineum has not as much to do with it as some would say. Again, in other cases the repair of the perineum does give much relief. I have always looked on the question much as Dr. Montgomery has said; the uterus may be displaced and give no trouble unless there is some condition of the tube, rectum, or appendix, usually adhesions; that there has been infection which is causing the trouble. If in such cases you remove the adhesions the patient may get well without any operation for the displacement. So far as operation is concerned, I must say that I operate in accordance with what I find. Sometimes we may find a diseased ovary and tube. If so, I remove them and sew the stump into the lower part of the womb, thus lifting up the womb. In many cases such women have become pregnant and have had no more trouble with their pregnancy than if such an operation had not been performed. If you examine a woman like that six months after sewing the stump in the lower angle of the womb, you will find a normal instead of a twisted position, with nothing done but removal of the ovary. In other cases I do what I advocated more than twenty years ago; when a woman is beyond the child-bearing period, and there is no chronic inflammation, I do a vaginal hysterectomy, stitching the broad ligaments together. The woman will get well and remain well without having the complicated operation which is sometimes done. Every case ought to be judged by its own peculiarity, and all these operations are more or less good.

Dr. Henry Hutchins, Boston: Replying to Dr. Barrett and Dr. Goldspohn, I would never refuse to correct the retroposition which we all recognize as one of the surgical malpositions of the uterus in all cases where it causes symptoms. The paper was chiefly concerned with the anteposed uterus which may be simulating the symptoms of retroposition. I would never advise operation for an anteposed uterus, although causing symptoms of retroposition, until I had given other methods a sufficiently long trial, such as the use of the Smith or Hodge pessary, the knee-chest position with deep breathing, etc. By a sufficient trial I mean two or more years. There is, however, a class of patients who do not want to wear a pessary. They tire of the knee-chest position and want to be put in good shape. In these cases I would advise suspension even of the anteposed uterus when found to be in descent. There is one point on which I cannot quite agree with the statements

made that in all of these cases the great majority of symptoms are caused by adhesions and distinct pelvic disease. Of course, these cases form an entire class by themselves. There is a class where there are no pelvic adhesions, no pelvic disease, but still the anatomic displacement of the uterus is causing the symptoms. They are two entirely different classes. I do not think that there is a group of anteposed uteri which are in descent which will cause symptoms even without the presence of adhesions or pelvic disease.

COLONIC INFECTIONS

SOME RARELY OBSERVED UNCLASSIFIED TYPES *

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In our experimental work on the vertebrates we have noted certain fundamental principles which have a bearing on the surgery of the gastro-intestinal tract, and particularly on the subject under discussion.

It is demonstrable that the rate of progress of intestinal contents is directly proportionate to their toxicity. To illustrate, the course through the duodenum and oral part of the jejunum is the most rapid of any, and the toxicity of these parts is the greatest. Long ago Roger demonstrated a parallelism between the toxicity and digestive power of the intestine. We believe that it exists, and that it is an important part of the bodily protective mechanism. Moreover as regards the intestinal flora, are not these inversely proportional, both in number and in virulence, to the digestive activity? Again, as we have already stated,[1] the acid reaction which we have frequently demonstrated to be present in the terminal ileum is a further factor undoubtedly protective in character. Evidently the hydrochloric acid of the stomach has a similar function.

Inherent in every organism is its power of protection, equally well developed against attack, either from without or from within. A thorough knowledge and a sympathetic interpretation of these fundamental protective properties seems to us of paramount importance in interpreting alimentary disease.

We have further found it useful to recognize nature's division of the alimentary canal into the segments which are protected by the physiologic barriers or sphincters under control of the involuntary nervous system. To these we have applied the generic terms cephalad, central, and caudad segments. This division has been extremely helpful to us, because it conduces to a study of the entire canal as a unit, and if our observations have taught anything, they have clearly demonstrated that of all the systems in the body none has been studied and treated more disjointedly than the alimentary canal. Thus we have long since put aside all considerations of isolated parts of the canal based on the anatomic divisions, having found it much more productive to seek an interpretation of aberrant conditions in terms of physiologic rather than morphologic units. By this process of reasoning we have reached several important conclusions.

As Sweet says,[2] working hypotheses are necessary to surgical progress. The only hope of progress is to search along the lines indicated by physiologic hypotheses. Looking at the alimentary canal, then, in its entirety and studying its pathologic physiology from a standpoint of physiologic sphincter segmentation, one notices that digestion is a segmental process, and is confined to the central segment. The oral segment is preparatory. The aboral is excretory.

As one would expect from these facts, inflammatory lesions are most frequent in the caudad segment, in which the opportunities for trauma are greatest, owing to the character of the material; to the presence of great quantities of bacteria, and to the indisputable fact that the protective elements already noted as inversely proportional to the digestive powers are least.

Focussing our attention more directly on the area of the intestine under special consideration in this paper, we first invite your attention to the ileocolonic sphincter. There are many inherited misconceptions in medicine; not the least is that the ileum is separated from the colon by a mechanical valve. Up to a short time ago our faith in the digestive function of the stomach was implicit. Experimental and clinical proof has changed our views. Proof from the same source is now abundantly at hand as regards the ileocecal valve. Barsh, Draper and Barber proved that the ureterovesical protective mechanism was a neuromuscular contrivance, rather than a valve. These same principles apply to the ileocecal sphincter. Elliott and the authors have shown that this mechanism can be controlled by the injection of epinephrin. We have performed injections on many persons presenting ileocecal insufficiency, as demonstrated by the Roentgen rays, and have shown that 10 minims of epinephrin is sufficient to control the leak, which later reappears. This fact may be of use in establishing a differential diagnosis between leakage due to loss of internal secretory or sympathetic tone and mechanical interference with the closure of the sphincter.

Another physiologic factor which has direct bearing on the topic under consideration is the recently described inhibitory center, located, according to Keith and Cunningham, in the terminal ileum. Whether, as suggested by W. J. Mayo, this center may be of such great importance in the syndrome of constipation that its removal may be the chief cause of the improvement which not infrequently follows resection of the terminal ileum or not is a moot question. Of its basic importance, however, there can be no doubt.

With these principles in mind, we have assembled the last twenty-one cases of purulent infection of the colon which have come under our observation in the last four years and which have been treated according to the above principles. Some of those cases were so severe in type and the constitutional conditions were so deplorable that a previous diagnosis of tuberculosis had been made. The most striking example of this type occurred in one of the five cases seen by us in consultation at the Presbyterian Hospital through the courtesy of Drs. Brewer, Carter and Swift, and in one referred by Dr. Isaac Adler.

CASE 1.—L. M. was admitted Jan. 1, 1916, complaining of blood in stools, diarrhea, vomiting, abdominal cramps and loss of weight. These symptoms were of seven months' duration, having come on gradually seven months before. The

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* From the Clinic of Rectal and Colonic Diseases, Polyclinic Medical School and Hospital, from the Laboratory of the Polyclinic Hospital, and from the Laboratory of Surgical Research, New York University.

1. Lynch and Draper: Contribution to the Surgical Physiology of the Colon, Ann. Surg., 1915, lxii, 441.

2. Sweet: Intestinal Obstruction, Ann. Surg., 1916, lxiii, 720.

vomiting usually followed the ingestion of food, but without relation to the character of the food. It has persisted at irregular intervals, but has never contained any blood. There was diarrhea with profuse, watery stools, from five to eight, every twenty-four hours, associated with some polyuria. Blood was not noted in the stools until three weeks before entrance. Painful swelling of the feet and ankles began six months before. The patient could not walk and was confined to the bed for a month, and treated in Mount Sinai Hospital for two weeks. He has had some pain in his hands but they have never been swollen. Dyspnea and orthopnea developed during the six months previous to entrance. Three weeks before the mother noticed some red spots over the anterior surface of the tibiae, which seemed to be tender.

On physical examination the patient was found to be poorly developed and very poorly nourished and appeared chronically ill. He did not appear to be in pain and showed no dyspnea or cyanosis. The skin was pale, smooth, hot and dry. There was no eruption on the chest, but on the anterior surfaces of both legs there were a number of small, rounded, nodular masses, slightly raised and a little tender. The skin over the nodules was reddened, and there was a little areola extending beyond. The tongue was coated somewhat, tonsils cryptic, but not enlarged. Otherwise the head was negative. The superficial lymph nodes on both sides under the angles of the jaw, some in the axillae, the epitrochlears on one side, and both inguinal groups of glands were palpable. The lungs were negative. The heart was slightly enlarged to the left, the sounds rapid, rather poor muscular quality, with a faint systolic murmur at the apex. The abdomen was slightly scaphoid, and moved slightly with respirations, which were chiefly thoracic in character. The abdominal wall was soft. There were no areas of cutaneous hyperesthesia or muscular rigidity or hypersensitiveness. In the right lower quadrant, midway between the umbilicus and anterior, superior spine was felt a compressible, tubular mass, nontender, which slipped under the finger and was thought to be a loop of intestine. The liver and spleen were not palpable, the lower pole of the right kidney palpable. A rectal examination revealed a tag just inside the sphincter, very much like a hemorrhoid.

On Jan. 7, 1916, the patient was seen by Dr. Fordyce, who regarded the skin lesions as probably tuberculous (tuberculids). A specimen taken for pathologic examination showed in frozen section chronic inflammation; the paraffin sections were unsatisfactory, and the sections for tubercle bacilli were negative. The blood cultures were sterile. The stools were negative for typhoid, parasites, blood and tuberculosis. There was much pus but no dysentery bacilli. On January 16 proctoscopic examination by Dr. Carter showed at the anus and extending up from the mucocutaneous junction several granulating ulcers. The sigmoidoscope inserted 18 cm. showed the mucous membrane granular with numerous areas of ulceration, which bled readily. A diagnosis was made of tubercular ulcerative sigmoiditis and proctitis.

A blood count showed red blood cells 5,700,000, hemoglobin 80 per cent., white blood cells 22,200, polymorphonuclears 62 per cent., lymphocytes 32 per cent. On January 5 the white blood cells had been 26,800, polymorphonuclears 88 per cent., and lymphocytes 12 per cent.

Two Widal tests were made which showed in 1 to 20, good clumping; 1 to 40, slight clumping, and in 1 to 80, no clumping. The von Pirquet was very faintly positive.

On January 20 the white blood cells were 16,000, polymorphonuclears 64 per cent., and lymphocytes 28 per cent. The urine was negative. The patient was seen by Dr. Brewer, who believed that the case was hopeless from a surgical standpoint, and not until operation was insisted on by Dr. Carter, who had seen some patients improve markedly on ileostomy, followed by irrigations of the colon, did he consent to do the following operation.

On Feb. 5, 1916, ileostomy was performed by Dr. Brewer. The cecum, ascending colon and transverse colon, as well as the descending and sigmoid colons, were found markedly thickened and the peritoneal surface somewhat roughened. The ileum was quite normal in gross appearance, as was the rest of the small intestine. There were a few enlarged glands near the cecum, which were firm, and one in the mesoappendix was removed for examination.

Procedure: A three inch vertical incision was made over the outer third of the right rectus about the level of the anterior superior spine. Exploration was done, the terminal ileum was brought into the wound, and the mesentery opened about 1½ inches from the ileocecal junction. A glass rod was inserted into this opening, and the loop of intestine brought out of the peritoneal cavity. A few interrupted sutures were put through the peritoneum and aponeurosis. The usual appendectomy was done, the stump being inverted. There was an enlarged gland in the meso-appendix which was removed for examination. The gland proved to be a normal lymph gland. A diagnosis of chronic appendicitis was made.

Daily dressings were done, and the colon irrigated with a solution of 1 to 5,000 potassium permanganate. The patient was kept on the roof, and given a liberal diet. His color improved, the skin improved, and he gained strength, but apparently no weight. When he was able to be weighed, four weeks after operation, he weighed 57½ pounds (he had weighed 67 pounds before operation). Irrigations which at first brought away considerable blood and mucus gradually cleared up. After five weeks' feedings of buttermilk, from 4 to 8 ounces were alternated with the irrigations, two or three times daily, and patient gained 22 pounds in six weeks on this procedure. He has rapidly improved in every way, eats very heartily and is quite active. He now weighs 79¾ pounds. He has had proctoscopic examination by Drs. Carter and Lynch, who now find the mucosa of the rectum and sigmoid quite normal in appearance, and believe that he is in good condition to have the ileostomy closed.

This boy gained 22½ pounds within six weeks after the operation. He was seen by us quite recently, and we advised closing the ileostomy. The restoration of the function is perfect.

Case 2.—A. M., aged 23 years, was first seen September, 1911. The chief complaint at that time was epigastric pain coming on from one to two hours after taking food, and heartburn. Two weeks previously there had been an attack of diarrhea lasting ten days. A gastric analysis made by Dr. Adler approximately six months previously showed a simple hyperacidity. Antacid treatment relieved all symptoms. The bowels, with the exception above noted, were regular, and the urine was normal.

Physical examination made September, 1911, revealed no abnormalities other than an occasional friction sound and an occasional inspiratory crepitant râle over the right apex posteriorly.

The onset of the condition occurred in July, 1912, when a slight amount of blood was noted at stool. About two months later bleeding began again. Examination revealed two fissures radiating forward from the rectum. Rectal examination was negative. Under protargol the fissures healed rapidly, but the bleeding continued. Proctoscopic examination in December, 1912, showed an intensely congested membrane studded with pinpoint ulcers. Mixed treatment internally, combined with silver nitrate irrigations locally, produced diarrhea and augmented the amount of blood passed. In February, 1913, the patient was given a proctoscopic examination again, by a different man, who noted the same pathologic picture, but ordered a bismuth, iodoform, oil irrigation, to be retained all night and a krameria, liquor antisepticus alkalinus irrigation for morning use. For two weeks slight improvement followed this treatment, but then the bleeding began in increased amounts.

Bacteriologic examination of the material showed streptococci of the viridans type and numbers of the *Bacillus coli* group. Dr. Barber inoculated guinea-pigs with some of the material and the pigs died after some weeks. The necropsy which I performed on them was negative.

In order to study the natural repairs in peritoneal and nonperitoneal covered end-to-end anastomosis, the pelvic colon of a dog was drawn up, cut, and anastomosed end to end as far caudad as possible at two different places separated by an interval of 5 cm. This operation was performed Feb. 3, 1914,

and on February 16 necropsy was performed. There was little difference in the lumina of the anastomotic openings. The lower or nonperitoneal-covered was the smaller. The liver, spleen and pancreas were congested. Microscopic sections of the anastomosed areas showed unions by fibrous tissue growing in from stroma, submucosa, and muscularis. There was very slightly increased vascularity of the caudad section (nonperitoneal), or no increase at all.

In order to study the causative agent in hemorrhagic colitis, on March 27, 1914, hemorrhagic material was injected into the rectums, previously curetted, of two guinea-pigs and one rabbit. On April 13, necropsy of one guinea-pig by the bacteriologist showed that the liver was congested, the mesenteric glands enlarged, and the appendix loaded with feces. Cultures made from the glands showed a colon-like organism resembling morphologically the organism regained from the original material injected and previously examined bacteriologically. Further cultural reports are forthcoming. The remaining guinea-pig and rabbit are well and normal to all appearances. On April 3, 1914, the same material was similarly injected into two guinea-pigs and one cat. On the 11th one guinea-pig died. Necropsy showed that the retroperitoneal and mesenteric glands were enlarged. No cultures were taken, but microscopic study was made of the liver, spleen and glands. No destructive changes were discoverable in either structure. There was hyperplasia of the lymph nodes.

Three Wassermann tests of the blood proved negative. A stained smear of the rectal discharge prepared by Miss A. H. M. showed a predominance of encapsulated diplococci, occasionally occurring in chains. The only other bacteria found consisted of large, thick bacilli. An examination of the passages from the bowels showed a gram-positive diplococcus, a gram-negative micrococcus, and several gram-negative bacilli, together with pus and mucus. The analysis at frequent intervals regularly gave normal findings. On March 1, 1913, the hemoglobin was 65 per cent. On March 8, 1913, the hemoglobin was 70 per cent., red blood cells 4,600,000, white blood cells 9,600, polymorphonuclears 76 per cent., lymphocytes 22 per cent., eosinophils 2 per cent.; the systolic blood pressure was 125 mm. of mercury, and the diastolic 90 mm. Moderate poikilocytosis and anisocytosis was present.

On March 22, 1913, the white blood cells were 10,000, polymorphonuclears 74 per cent., lymphocytes 26 per cent. On the 26th a vaginal smear showed occasional large, round diplococci and thick bacilli. March 3 and 7, 5 and 10 million *B. coli* C. were injected. Blood examination on June 10 to 13 by Miss H. A. M. showed hemoglobin 70 per cent., red blood cells 4,800,000, white blood cells 7,200, polymorphonuclears 76 per cent., lymphocytes 24 per cent., and no abnormal cell formation.

These histories are given in full because they are classic examples, the one of an acute type, the other of a chronic type with exacerbations.

Of these twenty-one cases, eleven were definitely acute and ten were chronic, with acute exacerbation. The average age of the patients in the acute group was 26.6 years; of those in the chronic group, 37.7 years. The average duration of the acute type of the disease was 32.3 months; of the chronic, 70 months.

Thus, there are certain types of acute purulent and hemorrhagic inflammations of the colon that cannot be attributed to any specific organism. They are characterized by sudden onset of diarrhea, blood, mucus and pus. Sometimes, as in Mummery's case, which closely resembles some of our own, the pulse was rapid; nearly imperceptible, the temperature 104, and the patient presented a picture of the third week of typhoid. Emaciation is marked and prostration extreme. The stools have a fetid odor and pus is passed in such quantities as to suggest the evacuation of an abscess. The stench of this is overpowering.

In other cases, though the diarrhea is severe and the amount of blood lost is considerable, still the digestive disturbances are slight, suggesting an increased peristalsis in the colon only.

The proctoscopic picture of the acute form is typical. The mucous membrane is edematous and dark red, granular, pebbly or bosselated in appearance. It closely resembles fish spawn, loosely strewn over the surface and the mucous membrane appears to be lifted away from its subjacent structures. There are no definite ulcers, the entire intestine being one confluent ulcer.

As the acuteness diminishes the picture changes. The mucous membrane is less edematous and covered by irregular patches of exudate, which closely resemble macerated skin. Between the patches are irregular oblong ulcers, varying in size and depth, with overhanging edges and worm-eaten bases. As the inflammation abates under treatment the mucous membrane becomes pale, and polygonal areas, separated by an arteriovenous network, give to the bowel a checkerboard appearance. It still retains its granular character and bleeds easily if touched.

Finally the mucous membrane seems to become adherent to the muscular coat and loses that elasticity of motion so characteristic of a normal bowel.

After recovery, the dry, shiny, glassy appearance of atrophy appears. The histopathology is perhaps more variable than the gross pathology and is therefore more difficult to give. It is based in many cases on the examination of small bits of tissue removed with a punch, or to small pieces removed during the operation for colostomy. It is that of an acute inflammation involving a mucous membrane and its subjacent structures. In all cases there has been marked congestion accompanied by edema. Congestion and edema may be limited to the mucosa or submucosa or may involve the entire intestine wall. The mucosa may be covered with an exudate composed of pus cells, bacteria, and inflammatory elements. It may be devoid of glands in case necrosis has progressed, or the inflammatory change may be limited to edema, congestion and accompanying swelling of gland epithelium. In one case the exudate throughout was more marked in the mucous and peritoneal coats. The crypts of Lieberkuehn had entirely disappeared and were replaced by an exudate composed of round cells. The blood vessels were abundant on the free surface and engorged with blood. The submucosa and mucosa had entirely disappeared, their place being taken by the exudative layer, which rested directly on the muscular coat. Round-cell infiltration of varying degrees according to severity of process was of course observed. This may be limited to the mucosa or involve the entire intestine and its peritoneal covering. Lymphatic tissue presented no changes except those produced by adjacent inflammation. Such parts of the plexus of Auerbach and that of Meissner as it has been possible to demonstrate appeared normal. The muscular coats were at times involved in the general reaction and presented the usual appearance under such conditions. In two instances the cecal wall was of tissue-paper thinness though all structures were demonstrable. In one acute case submucous cell groups, simulating tubercles and containing giant cells, were found. The tubercles were in structure like those produced in mesenteric glands by foreign body irritation. Mucopurulent, blood-stained discharges from the lower intestine, so charac-

teristic in these cases, have been repeatedly examined for bacterial and possible infusorial content. The results of these examinations were distinctly disappointing in so far as throwing any light on the etiology of the condition. No unusual forms of bacteria or predominating forms of bacteria were found.

In 50 per cent. of the cases the appendix showed a similar pathology.

In addition to the twenty-one cases critically studied during the past four years, we have incorporated information gleaned from seventy-eight cases of our own and of the late Dr. Tuttle, besides seventy cases collected from the literature. Of the latter, however, very few conformed to the type of infection with which we are dealing, being of the specific type.

Braun,[3] and Neumann and Mayer[4] in their writings have failed to suggest any other parasite than those already named.

Kaufmann,[5] in his study of the specific infections limited to certain segments of the intestine, includes dysentery, both the amebic and the bacillary type, cholera, tuberculosis, syphilis, actinomycosis, anthrax and gonorrheal proctitis (described by Benson,[6] Bel,[7] Couret, Bowman[8] and others).

Schmidt[9] negates Kaufmann's classification and names the inflammatory diseases of the colon according to the segment involved and to the infecting organism.

Aschoff[10] speaks of specific infections under the same headings. He tends to regard the intestinal tract as a whole except when dealing with the appendix and the rectum.

Boas, according to Schmidt, was the first to study and report a well-defined case of ulcerative colitis of indefinite etiology.

Rosenheim[11] writes of a number of cases in which the physical signs, clinical symptoms, and the course of disease closely resembles those observed by us. He advances several etiologic theories, change in chemical reaction of content of large intestine, change in activity and pathogenicity of intestinal bacteria, etc. His patients have been as a rule under middle age, ranging from 8 to 40 years, and he has noticed that many of them were deficient in stamina. Young, nervous, and anemic individuals predominated and sex exerted no apparent influence. The pathology, as seen by Rosenheim, is that of a true infection of the mucous membrane, occasionally complicated by infiltration of the intestinal walls and peritonitis. Erosions and especially ulcers were secondary manifestations. The colon was affected in varying extent and intensity. The sigmoid flexure was most commonly involved and anatomic changes were always more marked in this segment. Multiple neuritis, endocarditis, and joint involvement were mentioned among the possible complications. (Three of the authors' cases presented very severe skin infections.) It is interesting to note that in 1908 Rosenheim said: "The severe chronic colonic inflammations here considered are not mentioned in textbooks and only occasionally noted in literature. Clinical pictures belonging to this class are here and there described as ulcerative colitis or dysentery." Zweig[12] understood by ulcerative colitis "every form of intestinal catarrh which, beginning as an acute inflammatory process of the mucous membrane of the large intestine, is eventually productive of ulceration. Ulcers are usually in the rectum and sigmoid, but can extend to the cecum, and vary from lentil size to that of a thaler. Symptoms are those of a general infection with frequent stools containing pus, blood and mucus. The amount of blood may vary from an optically imperceptible quantity, to one or two liters, which latter quantity was lost by one of Zweig's patients. The etiology was a matter of conjecture, but an unrecognized form of bacteria might be responsible. The change in virulence of *B. coli* should be considered. He observed three cases in which achylia gastrica was well marked, and perhaps the antizymotic action of hydrochloric acid produced an increase in virulence of bacteria of the intestine, acute inflammation with ulceration resulting. As predisposing causes he has found diverticula in three cases. Operative procedures mentioned by Zweig were artificial anus at various portions of the colon, intestine junctions and appendicostomy. He advocated measures that assured the intestine absolute rest by complete diversion of the fecal current.

A contribution to the surgical literature of colitis is made by Beck.[13] Though Beck is usually quoted in articles on colitis gravis, the conditions observed by him were secondary to organic disturbance of the intestinal tract, such as carcinoma, and the specific infections, such as tuberculosis, typhoid, etc. The nervous elements were not considered by him as of primary value in colonic inflammations. Ileosigmoidostomy was the operation advocated by Beck and employed by him in six cases. Most comprehensive is the chapter devoted to colitis gravis by Schmidt. This excellent article is well worth reading. Within the last six years isolated cases of colitis gravis have been reported by Baustark,[14] Lindenberg,[15] Albu[16] and others. Albu considers acute ulcerative colitis of doubtful origin very rare. One of his two patients died of intercurrent disease, the other progressed to chronic ulcerative colitis, which Albu thinks is very seldom cured. Lockhart Mummery described some interesting cases of what he termed acute hemorrhagic colitis. Some of these closely resembled those seen by the authors. He performed appendicostomy, but from experience with several cases in which this operation had been done, we feel certain that this operation is inadequate.

In studying the literature, of which the foregoing is an abstract, one is impressed by the multiplicity of names and the hopeless intricacy of the nomenclature; also by the fact that the specific as well as nonspecific forms are grouped under a single head. It is not to be wondered at, considering the newness of the topic and the difficulties under which one labors in isolating the specific cause of the differing dysenteries.

As Herbert Carter has said, he is satisfied that many of the fatal cases with a diagnosis of bowel tuberculosis were in reality of the nonspecific type of infection and could have been saved by ileostomy. Case 1

3. Braun, Max: Die tierischen Parasiten des Menschen, 1908.
4. Neumann, R. O., and Mayer, Martin: Wichtige tierische Parasiten und ihre Ueberträger, 1914.
5. Kaufmann, Eduard: Spezielle pathogenische Anatomie, Ed. 5.
6. Benson, W.: Ztschr. f. Infektionskr., 1908.
7. Bel, G. S., and Cqurret, M.: Jour. Infect. Dis., 1910, vii, No. 5.
8. Bowman, F. B.: The Pathogenesis of the Balantidium Coli, THE JOURNAL A. M. A., Dec. 2, 1911, p. 1814.
9. Schmidt, Adolf: Klinik der Darmkrankheiten.
10. Aschoff, Ludwig: Pathologische Anatomie, Ed. 3.
11. Rosenheim, T.: Deutsch. med. Wchnschr., 1908, Nos. 7 and 8; ibid., 1913, No. 21.
12. Zweig, Walter: Arch. f. Verdauungskr., 1907, No. 14.
13. Beck: Arch. f. klin. Chir., 1904, No. 74.
14. Baustark: Deutsch. med. Wchnschr., 1911, No. 16.
15. Lindenberg: Arch. f. klin. Chir., 1912, No. 99.
16. Albu, A.: Deutsch. med. Wchnschr., 1912, No. 38.

illustrates this. The diagnosis was not always cleared up by the histologic findings, for we have noticed great difference of opinion among experts as to the interpretation of the microscopic change.

One is also impressed by the improper use of nonphysiologic measures. We cannot, for instance, see the indication for an ileosigmoidostomy for acute infections of the colon as practiced by one of the above authors.

There were eleven four plus acute cases. Of these, nine patients were operated on; two refused operation. Of those operated on, three were cured, three are pursuing the same clinical course and are rapidly improving, but sufficient time has not elapsed to place them under the cured cases. Two are improved. One was operated on by a colleague, but succumbed later to hemorrhage from the bowel. An appendicostomy was done. We think that cure might have resulted had an ileostomy been used in its place.

The two who refused operation are improved under treatment, but suffer from acute exacerbation when treatment is discontinued.

Of the patients operated on, two refused major operations (ileostomy), but submitted to appendicostomy. They are pursuing the same course as the two cases medically treated, namely, they have gained rapidly in weight and are apparently well, but from time to time they suffer from acute exacerbation.

We found it necessary in one case of ileostomy to perform a developmental reconstruction of the colon because a multiple segmental polyposis was grafted on the original infection. This case has suggested to us repeatedly the relationship between polyposis and continued inflammation of this type.

Of the three plus or subacute cases, there were nine. Seven were operated on, four having been cured. Three were complicated by diffuse multiple polyposis; although they have gained from 10 to 40 pounds, numerous polyps are present, and we therefore are unable to place them among those definitely cured. Thus we cannot close them, and although all traces of inflammation have subsided, still we feel certain that if we were to turn on the current again, they would undoubtedly have a recrudescence. One of these most interesting cases our colleague, Dr. Treby Lyon, has already collaborated with us in reporting in an article giving full detail of his own case.[17]

Of the remaining two, the first patient, an aged woman who had been bedridden and unable to recognize her family for more than a year, was mentally restored within a few days after ileostomy, and was able to return to her household duties. Although she finally died one year after the operation, necropsy showed intercurrent renal involvement. The results so far as justification of the operation went, were brilliant. The restoration of this woman's intellect was amazing. The last case, that of a baby of five years' postoperative standing, is quiescent while the ileostomy is open.

Of the remaining two, one was a patient with multiple polyposis, having from sixteen to eighteen mucopurulent, serosanguineous stools daily when she entered the hospital. Under medical treatment she gained in weight, and was having three movements daily when she returned home. We advised her son, a physician, that it would be necessary for her to have an operation to insure cure.

17. Lyon, Treby: Ann. Surg., lxii, 441.

This is a very interesting group, in that many had been incapacitated for years, had had incomplete operations performed and were despondent and pessimistic as far as their chances of recovery were concerned. Four out of the six suffered from stenosis at various levels of the canal and required more than one operation before they were entirely cured. The stenosis was so extensive, in one case involving the descending colon, that end-to-side colosigmoidostomy had to be performed. This patient, who was a fireman on the New York Central Railroad, has gained 40 pounds and is now in perfect health. The fact that he requested to be transferred from an electric to the more strenuous work of coaling the Wolverine is sufficient proof of his capacity for work since his operation.

Another patient of this group has a perfect restoration of function, notwithstanding the fact that she had a very marked stenosis of the rectum and part of the sigmoid, and had to live with a colostomy for two years. After this the inflammation had entirely subsided, the stenosis had spontaneously improved through fibrolysis; lateral anastomosis was done to prevent any recurrence at the most contracted portion of the stenotic area.

Of the subgroup double plus acute, containing two cases, both were operated on. One is absolutely well; the other is very much improved, having still some stenosis which requires constant medical supervision.

What deductions can be drawn from these twenty-one cases of colonic infection? First, that acute purulent infections of the colon can be cured only by putting the entire involved bowel at rest. Local treatment is indicated in every case and should have a satisfactory trial before surgical measures are instituted. It has the advantage of putting the patient in the best possible position to withstand a surgical operation, because he always improves at least temporarily under proper local measures. The striking improvement after ileostomy is seen in the very acute cases. Especially was this so in the case we saw in consultation with Dr. Carter. The two patients operated on by ourselves and this one operated on by Dr. Brewer prove conclusively that this is the ideal operation when the entire colon is involved.

The old idea that if a stoma were made in the small intestines the patient would lose weight and rapidly decline has been proved to be a fallacy. The gain in weight in every case supports the theory that we have long held that there is an inhibitory center in the lower ileum, the activity of which is accentuated after ileostomy, and even though it sometimes takes weeks or months before this function is fully developed, still it does come eventually, and the majority of patients suffer little more inconvenience than do those who have a stoma in the colon. *The dictum which we laid down in a previous paper, that a stoma, to be efficient, must always be placed oral to the infection, still holds good.*

Of the twenty-one patients, six had appendicostomies, and while these improved temporarily and gained in weight, none is nearer to a cure than are those that have been treated by rectal irrigations. We lay particular stress on this because our friend, Dr. Willy Meyer, has always felt that appendicostomy would have accomplished the same result. Sufficient time has now elapsed to prove this to be erroneous.

A patient was seen by one of us (Lynch) in consultation with Dr. Isaac Adler about three years ago. This patient was of the same type as the patient

in the second case cited in this article. We suggested ileostomy at the time, but he refused to consider it. Subsequently Dr. Lilienthal performed appendicostomy, and the patient gained in weight, but has acute exacerbations.

There was one other case which proved exceedingly instructive and further confirmed us in our view that appendicostomy is not the operation in these cases. This was a case (Case H.) of acute infection. We performed an appendicostomy and the patient improved slowly. After six months he developed very large, deep and elongated ulcers in the rectum. We then performed a colostomy. Almost immediately there was a marked improvement in the patient's condition. He gained 30 pounds within a month or two, and within a comparatively short period began to resume his occupation. During all the time he had appendicostomy, though improved, he was still unable to attend to his work. While this patient is not entirely cured, yet in the light of our present knowledge and experience with similar cases we feel sure that he will have a complete restoration of function. We mention this as a further argument in support of our theory that appendicostomy is not sufficient.

Patient B, of the three plus grade, had been sick for six years previous to coming under our care. The mistake had been made in his case of placing a stoma in the middle of the inflammatory area. This patient subsequently was restored to health, but required several operations, and the convalescence was considerably prolonged by the fact that the surgeon who first operated did not appreciate the principles underlying the condition.

Of the twenty-one cases, three were complicated by a multiple polyposis. In one case in which we had performed a previous ileostomy we found it necessary to perform a reconstruction on account of a polyposis limited to the cecum and ascending colon. This patient is absolutely well.

Of the two others, one has improved immensely under local treatment. This was the patient referred to by Dr. Wyeth, but who refused to have ileostomy. She returned to her home in the South, and is now being cared for by her local family physician. The other had an ileostomy and has gained 40 pounds since the operation, and is a practicing physician in a neighboring state. He suffers no inconvenience; but still having some polyps left, he does not feel that his present symptoms would justify him in risking the radical operation, which would probably mean removal of the entire colon. From observations on this patient we feel sure that there is progressive regression of the polyps since operation.

From this study we have also gleaned some facts which will have an important bearing on the future treatment of strictures, namely, that if a stoma is made oral to the infection in every case, restoration of function will result. This particularly applies to strictures with multiple fistulous openings on the outside. The most brilliant results we have obtained have been in the above-mentioned cases. No attempt should be made to split open the fistulous tracts, as these gradually disappear with the infection, so that when one comes to close the stoma, instead of having an incontinent patient, as we formerly had, there has been complete restoration of function.

In conclusion we may state that purulent infections usually begin as an acute process, and may become subacute or chronic; that the segmental character of many infections suggests diminished tissue resistance due to a change in the vasomotor nerves as an etiologic factor; that active bacterial agents have not as yet been demonstrated, but that these perhaps belong to the normal bacterial flora of the intestinal canal; that a rapid increase in weight is compatible with a stoma in the small bowel; that purulent infections are very often overlooked because there is no definite ulceration. This mistake is caused by the extensive inflammation, for the blood and pus which covers the bowel may easily be supposed to come from some other part of the intestinal canal, and by the fact that the observer is dealing with an acute purulent infection which may be segmental in type. This should be appreciated early because we believe that particularly in the segmental type of infection the best results are obtained by making a stoma early in the disease.

ABSTRACT OF DISCUSSION

Dr. J. W. Draper, New York: I have seen a number of these cases with Dr. Lynch and can corroborate all he has said concerning them. That the involuntary system supplies many nerves to the colon which have their cells in the stellate ganglion accounts for the esoteric stomach symptoms so often associated with colonic disease. Elliott has shown that the thirteenth thoracic ganglion is in most active relation with the ileocolic sphincter. Ileostomy, though not yet in general use, like many other newly applied procedures, is relatively old, having been first done by an Italian twenty years ago. Dr. Lynch, however, was the first to appreciate the value of this operation and to apply it with a specific object in view. Sufficient time has now elapsed to prove its value beyond doubt. Moreover, it is based on sound principles in that it affords physiologic rest to the colon, and because it conforms to the law that a stoma, to be effective, must be oral to the infection. Our statistics have shown that in 50 per cent. of cases of colonic infection the appendix has the same pathology as the colon, suggesting that the original focus was appendicular. Ileostomy has had so immediate an effect on the nervous and mental conditions that we have been inclined to believe it traceable to a direct reflex of unknown character on the glandular secretions of the duodenojejunal epithelium. This hypothesis has derived some support from Barber's proof that the duodenum will dilate and contract in response to certain fixed operative procedures on the caudad ileum.

Dr. Jerome Morley Lynch, New York: I merely wanted to mention the medical treatment because in all these cases, except in the acute, and even in the acute at times, the method is well worth trying. A solution of potassium permanganate 1:5,000 is very helpful. In fact, some of the subacute cases we have been able to cure by using these irrigations of potassium permanganate or a teaspoonful of hydrogen peroxid to 1 quart of water. Medical treatment is worth trial in all cases, but physicians should be careful not to prolong it beyond the point where serious damage to the intestine may result. If it fails, there should be immediate recourse to surgery.

Proprietary and "Patent Medicines."—America has been called "The Paradise of Patents." For the immense fortunes that have been accumulated by the proprietary and patent medicine combinations, the promoters owe a debt of gratitude to the members of the profession that will never be revealed until the victims file their complaints at the opening of the books of "the recording angel." The course pursued is not so much a reproach on the integrity of the doctors as a reflection on their common sense and business acumen. While enriching the manufacturers, the dispensers have gained little and the patients have been made "poor indeed." The "proprietary prescribing habit" has been as fatal to the best interest of the doctors as the "dope habit" has been destructive to the health and happiness of its unfortunate victims.—Crenshaw, *Kentucky Med. Jour.*, September, 1915.

THE PARALYSIS OF POLIOMYELITIS

ITS TREATMENT IN THE EARLY STAGES

H. B. THOMAS, M.D.
CHICAGO

Every one appreciates the great importance attached to the earnest research being done to enrich the epidemiology of infantile paralysis, and sincerely hopes that, before another year, means of prevention and control will be at our disposal. But while the management of paralysis continues to confront us, much permanent damage can be prevented by proper treatment. It is not amiss, therefore, to review at this time the management of the paralysis.

Especial attention should be called to the advantages of less vigorous and more closely supervised treatment in the case of weak muscles. As Lovett and others have pointed out, the greatest danger to the convalescing infantile case is fatigue of the weak or paralyzed muscles. Fatigue should be prevented. This is not easily accomplished, because we are dealing with the child in all his vigor, except for the muscular defects. The chance to experiment with his arms and legs, which have been unable to serve him for awhile, but whose strength is now returning, encourages him to make them pull him about, thus using them until they are exhausted.

If I were allowed only two words of caution or advice to physicians, and through them to the parents of the many beautiful children stricken during the present epidemic of infantile paralysis, they would be: Prevent fatigue. By this I mean fatigue not only from the active movements of the child, but from passive motions and also from massage or electricity.

I believe that 25 per cent. permanent gain in muscular strength will be the reward when the weak or partially paralyzed muscle groups are properly protected and guided so there is a minimum of fatigue.

During the treatment of deformities in long-standing infantile cases, I have frequently been surprised at the return of muscular power following total or partial rest of the paralyzed or weak member.

During the present epidemic in Chicago, I have had an opportunity to study the paralysis in its acute stage while the patients were yet in the contagious ward for the five weeks' isolation. Some of these patients have been followed up after their dismissal from the hospital, and their early progress with and without treatment noted. The results suggested the following outline.

As these suggestions are intended for the physicians into whose hands the patient may fall after leaving the hospital, it is not necessary here to detail the management during hospitalization.

THE MILD TYPE OF PARALYSIS OR WEAKNESS

When the patient leaves the hospital, all tenderness and spasticity have usually disappeared in those cases which showed such symptoms, and the paralysis in the mild, near abortive type may, by this time, be apparently gone. When such is the case, the parent may accuse us of a mistake in diagnosis and isolation. We are particularly anxious that in this type of case there should be a card of written directions and that a physician should be called in. Otherwise, the fatigue following the childish exertion may permanently weaken groups of muscles which otherwise would become normal. Observation of this mild type will give the suggestion for management.

We should look for:

1. Weakness of back muscles when the child is sitting. Tendency toward curvature may be observed, and the proper care of these weak muscles may prevent a fixed scoliosis in later life.

2. Drop foot, eversion, inversion, etc., when lying or sitting.

3. Bending of the knee backward when standing.

4. Outward rotation of the thigh, abduction, adduction, etc., when lying down.

5. Weakness or dragging of the leg after play or after a long walk.

Frequently an apparently normal child, one which shows no signs of muscle weakness during the physician's examination, will be found to tire in groups of muscles by the end of the day. Permanent lameness may be prevented if fatigue is never allowed. In this near abortive type of paralysis, there is usually no tendency toward deformity on weight bearing, and no supporting apparatus is needed. Limited active and passive motions are permissible; also massage; but too much should be avoided, and an effort should be made to prevent fatigue. If the family is allowed to treat the child, the greatest gain will follow instructions to rest, and to give massage and passive motions guardedly.

THE SEVERE TYPE OF PARALYSIS

Among the children who leave the hospital are those who cannot stand or sit or use an arm. Their muscles appear normal, otherwise, but it is well to watch them for weak back muscles, etc., as in the near abortive cases. Attention is too often fixed on the paralyzed muscles, and the weak groups are unnoticed and neglected.

This severe type with deformity needs such support as the position suggests. Drop foot should have permanent support by removable apparatus, preventing position contractions and deformity, allowing no stretching and fatigue of the weak muscles by the pull of the opposing normal ones. Later, massage and passive and active motions should be used when indicated, and the effect on the muscles watched as a guide for continued treatment. It is much safer to underdo than overdo. When, on testing the muscles on the day following treatment, the power is found diminished, this is a plain indication for more rest and support and for less vigorous activity. The operative and muscle-educational treatment of the deformities which often follow infantile paralysis need not be considered here. It is generally admitted, I think, that electrical treatments should be used only in exceptional cases. There is normal sensation in this paralysis. Enough current to reach the affected muscles is too much for the surface, and the effects on the paralysis do not justify its use.

CONCLUSIONS

1. Recently much that is new has been learned regarding the care of the weakness and paralysis of poliomyelitis.

2. These weak and paralyzed muscles are sick muscles, with deranged nerve and blood supply, and should be treated as such.

3. Sick muscles tire easily, not only by active use, but also by passive use and by massage, and when they tire they are less able to functionate the following day. Their ultimate usefulness is also harmed.

4. Study the result following the treatment. Undertreat rather than overtreat. Avoid fatigue.

30 North Michigan Avenue.

A CHILD WEIGHING TWENTY-FIVE POUNDS AT BIRTH

D. P. BELCHER, M.D., SALE CITY, GA.

MRS. R. W. C., aged 35, height 5 feet 7 inches, weight 220 pounds; circumference at hips 50 inches, multipara, delivered Feb. 22, 1916, has had eight normal children, including a twin birth. These children have averaged from 7 to 9 pounds in weight. She had three miscarriages. April 15, 1915, she aborted after about a six weeks' gestation. Soon after she became pregnant again. Early nausea and vomiting were more marked than in the previous pregnancies. Labor began Feb. 11, 1916. Vaginal examination at 8 p. m. during the first stage showed left occipito-anterior presentation. The os was patulous, and permitted the introduction of three fingers. The labor pains were of normal frequency but short. After an hour, the os admitted four fingers, and the pains were still short. The patient was given 5 minims of pituitary extract; the pains became more severe, but had little effect on the passage of the head. In two hours the 5 minims of pituitary extract were repeated; the pains now became strong. The os was normally dilating, but there was still slight progress of the head. At 2 a. m., after a consultation with Dr. A. S. Hargrove, the patient received a third dose of pituitary extract of 15 minims. At 3:30 a. m., the head was born. The posterior shoulder was delivered with great difficulty. Much greater difficulty, however, was experienced in delivering the anterior shoulder; but with the added assistance of Dr. A. T. Stevens, this was finally rotated posteriorally, and accomplished. It required the combined efforts of the three physicians to deliver the remainder of the body. The child was a girl, weighing 25 pounds; it measured 12 inches across the shoulders, 28 inches in length and was perfectly formed. It was born dead. On examination of the mother, the perineum was found slightly lacerated. This was completely repaired by three sutures. Chloroform anesthesia was used. She made an uneventful recovery.

[COMMENT.—This case is remarkable as it was a girl child and the maternal measurements, as given, taken after delivery, were not abnormal save for circumference at the hips, which is rather large. The author states that the baby was perfectly formed; therefore, we may assume its head was relatively large, yet it was born without mechanical assistance and caused but slight perineal laceration.

W. T. Lusk ("Science and Art of Midwifery") gives the average weight as 7 pounds, and quotes Bailly as giving the average weight for boys as 7 9/10 pounds, and for girls, 7 1/10 pounds.

Lusk also states that the largest baby born in Bellevue Hospital, New York, weighed 11 pounds, but that he personally delivered, with forceps, one weighing 15 pounds. He also cites a case of Waller's in which the child weighed 15 pounds, 15 ounces. Lusk quotes Dr. Gleavis of Virginia, who reported that he had delivered a woman of a child weighing 18 pounds. Kormann claims to have delivered a woman of a baby weighing 9.8 kg., that is, 21 6/100 pounds.

Playfair, in the seventh American edition of his "Midwifery," mentions that a Nova Scotia giantess gave birth to a child weighing 23¾ pounds at term. She was 7 feet, 9 inches high. Her husband was also gigantic, 7 feet, 7 inches. The child was born in Ohio. It was their second. It was lost in birth, as no forceps could be procured of sufficient size to grasp the head. The fetus weighed 23¾ pounds, and was 30 inches in length. Their first infant weighed 19 pounds.

Birnbaum ("Malformations of the Fetus") mentioned a child weighing 11,300 gm. (24 9/10 pounds) at birth. Gould and Pyle ("Anomalies and Curiosities of Medicine") quote a number of instances of births of abnormally large children—one case in which the fetus weighed 24 pounds.

An apparently carefully reported case is that of F. Ortega (Fétus gigantesque mort-né, pesant nu 11,300 grammes, long de 70 centimetres et large, d'un acromion a l'autre, de 19 centimetres, *Nouv. arch. d'obst. et de gynéc.*, 1891, p. 481). The mother, a very tall Italian blonde, a primipara, was forty hours in labor. The child was born dead. Forceps were unsuccessfully applied. The child weighed 24 9/10 pounds (105 kg.). The maternal pelvis is described as very wide and roomy, and there was no tear. The child was weighed with a balance scale. It was 70 cm. long (over 27 inches), and was 19 cm. (7½ inches) across the shoulders. The umbilical cord was as thick as the operator's thumb. The birth of the shoulders was the most difficult part of the delivery. The woman was up on the ninth day.

On comparing the measurements given in Dr. Belcher's report, and those recorded in Ortega's case, we find that they tally fairly well, as the following will show:

	Case Reported	Ortega
Weight	25 pounds	24 9/10 pounds
Measurements across shoulders	12 inches	7½ inches
Length	28 inches	Over 27 inches

Ortega describes also great difficulty in birth of the shoulders.

A study of the reports concerning the birth of abnormally large children is likely to show that the weight and measurements are not always carefully taken. There is invariably a tendency to exaggerate the unusual. In all the cases cited, the infant's weight is less than the case reported above.—ED.]

THE CAUTERY IN TREATMENT OF JACKSONIAN EPILEPSY

FREDERICK A. RHODES, M.D., PITTSBURGH

History.—Mr. F. S., aged 18, referred to me by Dr. Sell, March 22, 1915, had been well until the age of 3, when he fell while crossing a railroad track, and was caught by a freight car on a passing train and dragged nineteen ties. He was unconscious for some days. He recovered from the accident fairly well, except that the left side of the body, arm and leg, was paralyzed for three months. He had to be taught to walk again. At 8 years of age he was hit on the side of the head with a brick, sustaining a depressed fracture on the parieto-occipital region. Convulsive attacks began when he was 10 years of age. They were at first of the grand mal type and very frequent. They gradually diminished in frequency until he was 16 years of age, when they were very few.

During the last six months the attacks have assumed the form of typical jacksonian epilepsy, occurring two or three times a week. The patient is not always unconscious in these attacks, but must lie down. The aura is quite constant, and consists of a numbness and pricking in the left hand rapidly passing up the arm; when it reaches the elbow "he is gone." He learned well at school until 10 years of age, after which he was unable to attend much but studied at home. He is quite an intelligent looking young man, well developed physically. Examination of the eyes shows the retina normal with no evidence of intracranial pressure. On account of the severity and the frequency of the attacks, it has been thought unwise for him to go far from his home without a companion. Examination of the head shows a slight depression in the right parietal region.

Operation and Result.—The patient was operated on, March 25, 1915, under ether anesthesia. The skull was trephined over the right motor area. There were dense adhesions of the skull and the dura. The cerebral cortex was somewhat necrotic. The arm area was removed with the galvano-cautery and the wound closed. There was complete paralysis of the left arm, forearm and hand by the second day. This rapidly disappeared. The patient made an excellent recovery from the operation, and was shown at the Allegheny County Medical Society, May, 1915, at which time he stated that he was entirely free from attacks and was learning a trade, working every day. As he is still entirely well and working, I feel that sufficient time has elapsed to report the case.

COMMENT

The interesting part of his history is that he was twice injured in the right motor area. The important point in the treatment is the removal of the motor area by the cautery, which is much more satisfactory than by the knife; it is followed by less bleeding and there is less possibility of as many adhesions. I have since used this method in other cases with good results. These will be reported later. There seems to be little doubt that the motor area of the opposite side takes on the functions of the destroyed area. The operation should produce a paralysis of the affected part by which we know that we were successful in cauterizing the right area. This paralysis is generally quite marked by the second day and disappears rapidly after the first week.

Therapeutics

CARDIOVASCULAR-RENAL DISEASE

With the strenuousness of this era, this disease or condition, which may be regarded as one of the accompaniments of normal old age, has become of grave importance, and nowadays frequently develops in early middle life. If it is diagnosed in its incipiency, and the patient follows the advice given him, the progress of the disease will generally be inhibited, and a premature old age postponed.

In the beginning the symptoms and signs of this disease are generally those of hypertension, and the treatment and management is that advised in hypertension. If the kidneys show irritation, as manifested by the presence of albumin and casts in the urine, or if they show insufficiency in the twenty-four-hour excretion of one or more salts or other excretory product, the diet and life must be more carefully regulated than advised in hypertension, and the treatment becomes practically that of chronic interstitial nephritis.

Sooner or later, in most instances of this disease, whether hypertension, chronic endarteritis or interstitial nephritis or any combination of these conditions is most in evidence, the heart will hypertrophy. As long as the circulation in the heart itself is good and not impaired by coronary sclerosis, and as long as this slowly developing chronic myocarditis has not advanced far, cardiac symptoms will not be in evidence; but if these conditions occur, or if the blood pressure is so greatly increased as to damage the aortic valve or strain and dilate the left ventricle, symptoms rapidly appear, and the heart must be carefully watched. Subsequently, as the disease advances, if the patient does not die of angina pectoris, apoplexy or uremia, the symptoms of cardiac decompensation will develop. As the heart begins to fail, a dilatation of the right ventricle causes passive congestion of the kidneys, and the chronic interstitial nephritis may progress more rapidly. It is often difficult to decide which is more in evidence, heart insufficiency or kidney insufficiency. The more the heart fails, the more albumin will generally appear in the urine, and the lower the blood pressure, especially the diastolic. The more insufficient the kidneys, the higher the blood pressure, especially the diastolic. The location of the edema will aid in deciding which condition is most in evidence. If the edema is pendent in feet, legs and perhaps genitals when the patient is up, with its disappearance at night, and more or less backache and pitting of the back in the morning, it is the heart that is most rapidly failing. If there is more general edema, the hands and face puffing, and there are considerable nausea and vomiting, headache and drowsiness, and perhaps muscular twitchings, with neuralgic pains, the most serious trouble at that particular time lies in the kidney insufficiency.

Kisch[1] sums up the prodromal symptoms and signs of cerebral hemorrhage. The heart is generally enlarged and hypertrophied. The patient is likely to be overweight or adding weight, and to suffer from intestinal indigestions. Signs of sclerosis of the blood vessels of the brain are evidenced by transient dizziness; headaches; impaired sleep; loss of memory, especially for names and words; slight disturbances of speech, momentary perhaps, and more or less temporary localized numbness of the hands or feet, or arms or legs, with perhaps flushing of some part of the body, or little localized spasms of vessels of other parts of the body, causing chilliness.

There is also a marked hereditary tendency to apoplexy.

Cadwalader,[2] after considerable investigation, has come to the conclusion that large hemorrhages into the brain are the rule in apoplexy, and that small hemorrhages are rare, and he is inclined to think that even small, as well as large hemorrhages, are more frequently fatal than supposed. In other words, he thinks that many of the nonfatal hemiplegias are caused by vascular obstruction and softening and not by hemorrhage. He finds that sudden death, or death within a few minutes, does not occur from hemorrhage, even if the hemorrhage is large, though a rapidly developing and persistent coma usually indicates a hemorrhage. If the coma is not profound and is slow in its onset, with symptoms noticed by the patient, and cerebral disturbance, he believes it to be caused generally by softening of the cerebral center, due to some obstruction of the blood flow, and not to hemorrhage. While occasionally a slowly increasing loss of consciousness may be due to hemorrhage, he thinks it is doubtful if real hemorrhage ever occurs without loss of consciousness, while softening of some part of the cerebrum may occur without unconsciousness. He thinks that the size of the hemorrhage is of more importance than its situation in causing the profoundness of the symptoms, but he repeats that nonfatal cases of hemiplegia are generally caused by vascular occlusion and subsequent softening, and not by hemorrhage.

TREATMENT

While it is urged, in preventing the actual development of this disease, and in slowing its progress, that it is advisable to lower a high blood pressure, we must remember that this blood pressure may be compensatory, and many times should not be much lowered without due consideration of the symptoms and the patient's condition. It is better not to use drugs of any kind in this incipient condition. The hypertension should be regulated by the diet; the purin bases and meat should be reduced to a minimum; tea, coffee and alcohol should be prohibited, and tobacco should be either entirely stopped or reduced to a minimum. Regulated exercise is always advisable, the amount of such exercise depending on the condition of the circulation. Ordinary walking and graduated walking or graduated hill climbing and golfing are good exercise for these patients. Mental and physical strenuosity must be stopped, if the disease is to be slowed. Sleeplessness must be combated, and perhaps actually treated medicinally, and for a time sufficient doses of chloral are perhaps the best treatment. The administration of chloral must always be carefully guarded to avoid the acquirement of dependence on the drug. Mouth and other infections should be sought and removed. Warm baths, Turkish baths, electric light baths or body baking may be advisable, and certainly obesity must always be combated by a regulation of the diet. In obesity, stimulants to the appetite,, such as spices, condiments, and even sometimes salt, must be prohibited. Butter, cream, sugar and starches must be reduced to a minimum. A small amount of bread and a small amount of potatoes should be allowed. Liquids with

1. Kisch: Med. Klin., Feb. 27, 1916.

2. Cadwalader, W. B.: A Comparison of the Onset and Character of the Apoplexy Caused by Cerebral Hemorrhage and by Vascular Occlusion, THE JOURNAL A. M. A., May 2, 1914, p. 1385.

meals should be reduced. Fruits should be given freely. Intestinal indigestion should be corrected, and free daily movements of the bowels should be caused. If the patient is obese, and especially if the blood pressure is high, the administration of thyroid extract is very beneficial. This is particularly true in women suffering from this disease; but the patient should be carefully observed during its administration. It may be advisable to administer small doses of iodid instead of the thyroid treatment, or coincidently with it. Nitrites had better be postponed, if possible, for cardiac emergencies.

White,[3] after studying 200 cases of heart disease, finds that men are more subject to auricular fibrillation, auricular flutter, heart block and alternation of the pulse than are women. The greater frequency of syphilis in men than in women should be considered in this difference in frequency.

White finds that hyperthyroidism of long standing is often attended with auricular fibrillation. He does not find that alcohol, tea and coffee play much part in causing these serious disturbances of the heart. His conclusions on this subject are certainly a surprise, and do not coincide with the experience of many others. It would seem that one of the causes of the greater frequency of these disturbances in men would be the amount of alcohol and tobacco used by men.

When the heart begins to fail from a gradually progressing myocarditis, the pulse rate generally increases, especially on the least exertion, and on fast walking may be as high as 120 or 130 a minute, or even higher. It may be found near 100 on the least exertion, even after some minutes of rest. These patients must have more or less absolute bed rest. When this condition occurs in old age, however, prolonged bed rest is inadvisable, for if the heart once loses its energy, in such cases, it is practically impossible to cause a return of normal function. However, in all acute cardiac insufficiency in this disease, due to some heart strain or exertion that was unusual, a bed rest of from one to two weeks and then gradually getting up and returning to normal activity is the proper treatment, and will generally be successful in restoring more or less compensation. These patients may well recline in bed with several pillows or with a back rest. During any cardiac anxiety in this kind of insufficiency the patient breathes better when he is sitting up or reclining with the head and shoulders high. The reason for this is probably because his heart has more space in this position—the same reason that he breathes better when his stomach is empty. Very indicative of the coming cardiac insufficiency is the inability to lie at night on the left side. The pressure of the body, especially if the person is stout, interferes with the heart action and causes dyspnea and distress. Some short, fat patients with cardiac distress caused by this disease must even stand up to relieve the condition, the erect position giving still more space for the action of the heart.

Before these patients get up, after a period of bed rest, slight exercises should be done, perhaps resistant exercises, to see what the effect is on the heart, and also gradually to cause increase in cardiac strength, much as any other training exercise. Whatever exercise increases the heart rate more than twenty-five beats is too strenuous at that particular period. The exercise should then be still more carefully graduated. If the systolic blood pressure is altogether too low for the age of the person or for the previous history, it should be allowed to become higher, if possible, before much exercise is begun.

The diet should be nutritious, but, of course, modified by the condition of the stomach, intestines and kidneys, and whether or not the patient is obese. The bulk of the meal should be small, and nutriment should be given at three or four hour intervals during the daytime.

The Karell milk diet or so-called "cure" was first presented in 1865 by Phillippe Karell, physician to the Czar of Russia. This treatment was more or less forgotten until lately, when it has been more frequently used in kidney, liver and heart insufficiency. Its main object in kidney and heart disease is to remove dropsies. In cardiac dropsy it is advised to give 200 c.c. of milk for four doses at four hour intervals, beginning at 8 o'clock in the morning. Whether the milk is taken hot or cold depends on the desire of the patient. This treatment is supposed to be kept up for six days, and during this time no other fluid is given and no solid food allowed. During the next two days an egg is added to this treatment, given about 10 o'clock in the morning, and a slice of dry toast, or zwieback, at 6 p. m. Then up to the twelfth day the food is gradually increased, first to two eggs a day, then more bread, then a little chopped meat, then rice or some cereal, and by the end of two weeks the patient is about back to his ordinary diet. During this period the bowels are moved by enema or by some vegetable cathartic, or even castor oil. If thirst is excessive, the patient must have a little water, and if the desire for solid food is excessive, even Karell allowed a little white bread and at times a little salt. He sometimes even prolonged the period of treatment to five or six weeks.

Various modifications of this treatment have been suggested, such as skimmed milk, and more in quantity, or a cereal is added more or less from the beginning, and perhaps cream. The diuretic action of this treatment is not always successful. Also, sometimes the treatment is even dangerous, the heart and circulation becoming weaker than before such treatment was begun. Certainly the treatment should be used in cardiac insufficiency with a great deal of care, although it is often very valuable treatment. It should be emphasized that most patients with cardiac dropsy receiving the Karell treatment or a modification of it should also receive digitalis in full doses, and should have daily free movement of the bowels. It should be urged, however, that too free catharsis in cardiac weakness is to be avoided, and the prolonged use of salines, and sometimes even one administration is contraindicated. Before cardiac failure has occurred in this disease, once a week a dose of calomel or a brisk saline purge is advisable, and is good treatment; but when cardiac weakness has developed, free catharsis is rarely indicated, although the bowels should be daily moved, and vegetable laxatives are the best treatment. The upper intestine and the liver and kidneys may be relieved by a more or less abrupt modification of the diet, or even a starvation period, and the bowels will generally become cleaned; but frequent profuse purging with salines or some drastic cathartic puts the final touch on a cardiac failure.

Recently Goodman[4] presented a report of his studies of the Karell treatment in cardiac, renal and hepatic dropsies. He finds that patients with uremia ordinarily

3. White: Boston Med. and Surg. Jour., Dec. 2, 1915.

4. Goodman, E. H.: The Use of the "Karell Cure" in the Treatment of Cardiac, Renal and Hepatic Dropsies, Arch. Int. Med., June, 1916, p. 809.

should not be subjected to the Karell cure, such patients needing more fluid.

As long as the patient remains in bed, and as long as his ability to exericse is at a minimum, gentle massage is advisable.

In these cases of cardiac weakness, with or without dropsy, unless the diastolic pressure is very high, digitalis is valuable. If there is no cardiac dropsy, but other symptoms of heart tire are manifest and the blood pressure is high, the nitrites are valuable. The amount should be sufficient to lower the blood pressure. Sometimes the diastolic pressure is high and the systolic low and the pressure pulse small because of heart insufficiency; such a condition is often improved by digitalis. In other words, with a failing heart digitalis may not make a blood pressure higher, and often does not; it may even lower a diastolic pressure, and the moment that the pressure pulse becomes sufficient, the patient improves. Under this treatment of digitalis, rest and regulated diet, a dilated left ventricle with a systolic mitral blow often becomes contracted and this regurgitation disappears.

The amount of digitalis that is advisable has been frequently discussed. It should be given in the best preparation obtainable, and should be pushed gradually (not suddenly) to the point of full physiologic activity. While it may be given at first three times a day in smaller doses, it later should be given but twice a day, and still later once a day, in a dose sufficient to cause the results. As soon as the full activity has been reached it may be intermitted for a short time; or it may be given a longer time in smaller dosage. In renal insufficiency associated with cardiac insufficiency, its action is subject to careful watching. If there is marked advanced interstitial nephritis, digitalis may not work satisfactorily and must be used with caution. If, on the other hand, a large part of the kidney trouble is due to the passive congestion caused by circulatory weakness, digitalis will be valuable.

In sudden cardiac insufficiency, provided digitalis has not been given in large doses a short time before, strophanthin may be given intravenously once or at most twice at twenty-four-hour intervals.

If, in this more or less serious condition of the heart weakness, there is great sleeplessness, a hypnotic must sometimes be given, and the safest hypnotic is perhaps 1/10 grain of morphin. One of the synthetic hypnotics, where the dose required is small, may be used a few times, and even a small dose of chloral should not be feared when sleep is a necessity and large doses of synthetics are inadvisable on account of the condition of the kidneys.

The value of the Nauheim baths with sodium chlorid and carbonic acid gas still depends on the individual and the way that they are applied. If the blood pressure is low and the circulation at the periphery is poor, they bring the blood to the surface, dilating the peripheral vessels, and relieving the congestion of the inner organs and abdominal vessels, and they often will slow the pulse and the patient feels improved. If they are used warm, a high blood pressure may not be raised; if the baths are cool, the blood pressure will ordinarily be raised. Provided the patient is not greatly disturbed or exhausted by getting into and out of the bath, even a patient with cardiac dilatation may get some benefit from such a bath, as there is no question, in such a condition, that anything which brings the blood to the muscles and skin relieves the passive internal congestion. Sometimes these baths increase the kidney excretion. At other times these, or any tub baths, are contraindicated by the exertion and exhaustion they cause the patient; and cool Nauheim baths, or any other kind of baths, are inadvisable with high blood pressure.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

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W. A. PUCKNER, SECRETARY.

MERCURIAL OIL.—Grey Oil.—A mixture containing from 40 to 50 per cent. metallic mercury in an oily base containing the mercury in a finely divided state and of a consistence which permits its intramuscular injection by means of a proper syringe at room temperature.

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Dosage.—Depending on the effects desired, the mercurial oil is administered once or twice a week, 0.06 Cc. (1 minim being the initial dose and 0.12 Cc. (2 minims) the maximum. The "course" should not be continued beyond five or six weeks, without an intermission of equal duration. It is reported that cumulative effects are prone to develop from the use of mercurial oil. Idiosyncrasy should be considered and salivation must be carefully watched for. Tenderness of the gums (the earliest sign of salivation) is an indication for stopping the use of the drug for a period.

In mercurial oil the globules of mercury tend to coalesce and form larger globules, and when this process is once started it progresses very rapidly. Mercurial oil should be kept at a relatively constant temperature and must not be warmed prior to use.

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E. R. Squibb and Sons, New York.

THROMBOPLASTIN-SQUIBB.—A solution of brain extract complying with the standards for solution brain extract, N. N. R. (THE JOURNAL A. M. A., Aug. 5, 1916, p. 437). It is claimed that no loss of potency could be detected in a specimen of thromboplastin-Squibb over eighteen months old. Marketed in 20 Cc. vials.

Manufactured by E. R. Squibb and Sons, New York. No U. S. patent or trademark.

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SATURDAY, SEPTEMBER 23, 1916

THE INNERVATION OF THE THYROID GLAND

Despite the universally admitted importance of the so-called ductless or endocrine glands, in the normal and abnormal performances of the organism, it must be frankly admitted that the methods of ascertaining their precise function have been anything but satisfactory. The necessity of a structure like the suprarenal gland for the very existence of the individual is attested by the abundant evidence derived from extirpation experiments. The indispensability of the parathyroid structures is similarly attested; and the profound physiologic upset obviously associated with some malfunctions of the thyroid tissue likewise bears witness of a dominant rôle played by the endocrine organs. Such knowledge, however, is far from furnishing the key to the more precise ways in which they act and enabling one to interpret the mechanism represented in the customary activities of indispensable tissues. We may now make correct statements regarding epinephrin and its discharge from the suprarenals, and we may discuss the varying content of iodin in thyroid glands under differing environmental or individual conditions; but these are not explanations of what happens in the intact organism when the structures here referred to perform in their characteristic way. When the salivary glands or the kidneys function, their work can be ascertained by an examination of a direct external secretion. The inability to do the same for the endocrine glands has retarded progress in their study, but has at the same time stimulated a lively interest in the problems which they offer.

Long ago it was demonstrated that just as alterations in electrical potential can be observed in muscles and nerves, as an accompaniment of physiologic action, so there are electrical changes discoverable during the secretion by the salivary glands. It has remained for Cannon and Cattell,[1] of the Laboratory of Physiology in the Harvard Medical School, to test the validity of the electrical response as an index of glandular action, and to apply this method of study to the glands of internal secretion where the recognition of the product of their secretory activity in the blood or lymph is uncertain or impossible. Because an electrical change accompanies the secretion of saliva, even though the blood supply is shut off from the gland or the flow through the duct is stopped, and because the change is absent when secretion is absent, although each of the conditions attendant on secretion (such as contraction and relaxation of blood vessels and faster or slower flow of blood) may severally be induced, the Harvard investigators have concluded that the electrical change is a manifestation solely of the process of secretion. It is well known that both the chorda tympani nerve and the sympathetic system operate on the salivary glands. In accord with this is the fact that when the "action current" indicates a maximal activity of the submaxillary gland excited by stimulating the sympathetic nerve in the neck, the electrical response can be augmented by stimulating the chorda tympani, and vice versa.

Obviously, as Cannon and Cattell clearly admit, an electrical change cannot yield information as to the nature of the materials elaborated in the several structures involved; it cannot determine the course which the products of secretion actually take in passing from their region of origin. Indeed, it might leave somewhat uncertain whether secretion or preparation for secretion were the process occurring in a gland at any given period of disturbed potential. Nevertheless, the method, by revealing the differences between relative quiet and activity, indicates conditions which affect the functioning of glands and thus suggest more definite studies; it may show the quickness, the extent and, roughly, the degree of the response; and it may disclose significant new facts regarding relations which exist among the glands and which are mediated by the circulation.

The best warrant for the further employment of such an indirect method in the study of the ductless glands is afforded by what Cannon and Cattell[2] have already accomplished with it. If the thyroid gland and neighboring indifferent tissue are connected through a galvanometer, stimulation of the sympathetic strand high in the thorax evokes an action current after a latent period varying usually between five and seven seconds. This effect persists after the superior and the recurrent laryngeal nerves are severed. Evidence is presented that the impulses pass to outlying neurons whose cell bodies are located close below the superior cervical ganglion and also in the inferior cervical region. Stimulation of the main trunk of the vagus nerve or injection of pilocarpin has no effect in producing an action current in the thyroid gland. The influences of sympathetic impulses are not indirect

1. Cannon, W. B., and Cattell, McKeen: Studies on the Conditions of Activity in Endocrine Glands, I, The Electrical Response as an Index of Glandular Action, Am. Jour. Physiol., 1916, xli, 39.

2. Cannon, W. B., and Cattell, McKeen: Studies on the Conditions of Activity in Endocrine Glands, II, The Secretory Innervation of the Thyroid Gland, Am. Jour. Physiol., 1916, xli, 58; III, The Influence of the Adrenal Secretion on the Thyroid, ibid., 1916, xli, 74.

through local anemia of the gland; for when the blood supply is wholly stopped by clamping the blood vessels for a period equal to that of the sympathetic stimulation no noteworthy electrical change is produced. The conclusion is accordingly drawn that the nonmedullated nerves distributed to the thyroid cells belong to the sympathetic and not to the vagus supply, and that their effects are not indirect through alterations of the blood flow; they are, indeed, true secretory nerves.

The foregoing studies conform with what is indicated by other types of evidence regarding innervation of the thyroid gland. From analogy with other glands one would expect the thyroid likewise to be provided with suitable nervous structures adapted to call its functions into activity. Histologic evidence actually indicates the entrance of nerve fibers into the cells of this gland, and anatomists have reported that the fibers arise in the cervical sympathetic ganglia. It is known that severance of its cervical sympathetic nerves causes atrophy of the thyroid and stimulation of these nerves causes a diminished iodin content of the gland. Severance of the vagus nerve supply has no such effect. The consensus of evidence, new and old, thus points toward a definite influence of sympathetic impulses over thyroid activity. For many reasons, both theoretical and practical, this is an important acquisition to our knowledge of the innervation of the endocrine gland.

MUNICIPAL CONTROL OF FOOD MATERIALS

Civic problems of health come up for solution one after another as cities grow in size and knowledge of sanitary science increases. Interferences with personal liberty for health reasons, which would have seemed quite preposterous a generation or two ago, especially in our Anglo-Saxon civilization, are now accepted as a matter of course, and undoubtedly similar developments will continue. A century ago, municipalities began to realize the public duty as to the disposal of sewage and waste materials. Then came the recognition of the necessity for affording an abundant and pure water supply. More recently the necessity for milk inspection and for the care of the food, which means so much for that portion of the community most liable to disease, the very young, came up for consideration. Naturally, after that the questions relating to the control of the food supply of adults, to such an extent at least as to prevent disease, were taken up. This represents, doubtless, the most important question now occupying the minds of sanitarians, the practical application of which to municipal affairs will do a great deal to prevent the occurrence of many of the intestinal affections at least, but probably of most others also which still flourish in large cities.

Proper municipal food control and inspection will involve many invasions of what have been considered precious privileges of personal liberty, but it will not be long before it will be recognized that these, like other developments of municipal health service, are amply justified by the favorable results in health and the prevention of disease which they assure. In its twelfth report, the Henry Phipps Institute of Philadelphia calls particular attention to the abuses which exist in that city and to the necessity of definite amelioration of conditions in the sale, storage and handling of food, if the spread of disease is to be prevented. What is true of Philadelphia is exemplified also in the provision of food for many other American cities, in some of which, undoubtedly, conditions are even worse than in the Quaker City. In a number of large cities recently the investigation of restaurants showed that there were many details in the handling of food which were insanitary and would surely have occasioned vigorous protest on the part of patrons had they been aware of the facts. Indeed, it is extremely easy for most people to slip into serious abuses in the handling of food, whenever it is not to be prepared for themselves or those in whom they are particularly interested.

The Phipps Institute report calls attention particularly to the exposure of food products to dust and dirt as well as to contamination from the unclean hands of sellers and customers, from contact with the clothing of passers-by, and occasionally even soiling by passing animals. Curiously enough, municipal markets in Philadelphia were found to be the worst in this regard, and "vegetables were often piled directly upon the ground, and dressed fowl hung along the edges of the market, directly over filthy gutters and so low that people entering the market constantly brush against them. . . . Dogs and cats have easy access, in fact there is no way to keep them out and much to attract them." In one stall where the proprietor said that he had government, state and municipal inspection, there was "a huge piece of beef, soft to the point of sponginess, terribly discolored, part of it slimy and part entirely dried up." The man assured the investigator that "this would not be sold to his customers, but was shortly to be called for by a Bologna sausage maker." This, certainly, would not encourage any one to buy Bologna sausage anywhere in the neighborhood of that market. The bureau of health in Philadelphia refused to license these stalls, yet they continue in business.

Above all, sellers of vegetables and meat food seem to have no hesitation in handling food materials to any extent. Some handling is necessary, but a great deal of the mussing with foods is quite unnecessary. Many of the moist food materials, meats, butter and cheese, as well as milk, readily become infected with anything that is on the hands of sellers, and yet few precautions are taken to avoid what may be serious consequences from this. The Phipps report points out particularly the need of assurance that food handlers

are not typhoid carriers and are not at the time suffering from any of the intestinal diseases or tuberculosis. The determination of such questions seems, to many, an almost unwarranted invasion of personal rights, and yet it represents the next development in public sanitation if there is to be definite assurance against the spread of these infectious diseases.

Manifestly a campaign of education of the general public and above all of legislatures is needed in order to secure such developments of sanitary legislation as will bring all food handlers properly under the control of health authorities. There is no doubt that cooks, kitchen workers and waiters, particularly in hotels and large restaurants, who are brought intimately in contact with food materials ought to have certificates that they are not carriers of typhoid or paratyphoid diseases and that they are not liable to be sources of infection because of the presence of other affections, intestinal or respiratory, in an active stage.

THE LIPOIDS ("FATS") OF HUMAN BLOOD

The center of analytic interest in both normal and pathologic metabolism, as THE JOURNAL has frequently stated, is shifting from the urine to the blood. A decade ago the withdrawal of a few cubic centimeters of blood from the vein of a human patient for purely diagnostic purposes was a somewhat formidable and certainly a decidedly uncommon procedure; today the collection of blood samples in man is a routine practice. Pathology, bacteriology and physiologic chemistry all have benefited by the accumulating data derived from such technical analyses of the blood. Information has been obtained of unquestioned importance in the domains of therapy and prognosis as well as diagnosis. It is no longer bewildering to an up-to-date physician to discuss the content of sugar, or uric acid, or nonprotein nitrogen in the blood, any more than it was either to consider comparable statistics about the urine a few years ago or to take guidance from a blood count or hemoglobin estimation.

Regarding the blood cells or formed elements, the oxygen-carrying blood pigment, certain immunologic components such as exemplify themselves in the Wassermann and other blood tests, and the sugar and nitrogenous constituents of the circulating blood, it can justly be said that quite satisfactory methods of clinical estimation as well as illuminating statistics are now available. One already hears of prognoses made in nephritis on the basis of the finds of a chemical examination of the blood.[1] At length the fatty components of the blood are also destined to receive a share of the attention of the clinical chemist.

It is a sign of more orderly knowledge in any field when questions of nomenclature begin to arise. The word "blood fat" no longer suffices to define the heterogeneous group of substances that have been included traditionally in that designation. Those substances, present in blood, which were originally grouped together because of their similar solubility in fat solvents, include the true fats — glycerids of the fatty acids; the phosphatids — lecithin, cephalin, etc.—ordinarily termed "lecithin"; and the higher alcohol cholesterol with its fatty acid esters. Bloor[2] has pointed out a possible natural propriety in the conventional grouping of the substances referred to under a common designation, in that they are quite probably all concerned in fat metabolism. For this reason he proposes to use the expression "lipoid" as a general term for all those substances connected with the metabolism of the fatty acids, including the fatty acids, their naturally occurring compounds, and such substances as cholesterol, which occur naturally in combination with fatty acids and are therefore presumably connected with their metabolism. The term "lipin," introduced by Gies to cover such groups, has found a limited acceptance.

Bloor[2] has applied the methods of lipoid estimation, which he has materially helped to perfect, to the complete analysis of the blood of a large number of both healthy and diseased persons. He furnishes some normal statistics on the basis of which deductions can be made in the future in evaluating analytic data that may be obtained from patients. According to his investigations at the Harvard Medical School, in normal blood the "lecithin" lipoid fraction of the corpuscles is found to be approximately double that of the plasma, while the cholesterol and "total fatty acid" values are always lower in the corpuscles than in the plasma. The value for "lecithin" in the corpuscles is generally about twice that of cholesterol, while in the plasma their values are nearly equal. The ratio between these constituents — "lecithin" and cholesterol — is quite constant in normal blood, especially in plasma, and remains so in most pathologic samples. This suggests to Bloor a definite relationship between these constituents, making it probable that cholesterol, perhaps as its esters, plays a part in fat metabolism. Conclusions of this sort apply, of course, only to analyses made on blood taken at a time (before breakfast) when the lipoid content in the circulation is not altered by products of absorption. Under such conditions the amount of true fats, that is, glycerids of fatty acids, in normal plasma is small; and in the corpuscles it may be absent entirely.

The importance of the complete lipoid analysis of the blood in investigating abnormal conditions is emphasized by Bloor's announcement that whereas what is ordinarily termed "fat" (total ether-soluble substance) is within normal limits in most patients, the blood lipoids far more frequently exhibit an apparent deviation from their usual concentration. Quoting Bloor's

1. The Value of Estimations of Creatinin in the Blood, Current Comment, THE JOURNAL A. M. A., Feb. 5, 1916, p. 433.

2. Bloor, W. R.: The Distribution of the Lipoids ("Fat") in Human Blood, Jour. Biol. Chem., 1916, xxv, 577.

interpretation, the most characteristic feature of pathologic conditions in human beings is the increase of "total fatty acids" and true "fats" in both plasma and corpuscles, and the decrease of "lecithin" in the plasma. Inasmuch as the "fat" is probably to be regarded as the inactive form of the body lipoids, the form in which they are stored — the raw material of fat metabolism — and the "lecithin" as the first step in its utilization,[3] an undue accumulation of "fat" or a decreased value of "lecithin" probably indicates a diminished activity of the fat metabolism. The ratio of lecithin to cholesterol is almost always a constant one.

In severe diabetes (for which lipemia has often been described) the blood lipoids are greatly increased, but the ratios between these constituents are practically normal. The low values for cholesterol found by Bloor in the plasma in anemia are suggestive in view of the antihemolytic effects attributed to cholesterol. Likewise of interest are low values for the phosphatids in the plasma of hemophilia; for Howell has pointed out that the phosphatid cephalin is associated with blood coagulation, and the injection of cephalin into the circulation or its application to bleeding surfaces is known to give evidence of a clot-promoting potency.[4] These examples suffice to indicate the promise of helpfulness given by the latest applications of lipoid analysis to the blood.

ADVERTISING THAT MAKES FOR ILL-HEALTH

One phase of the problem of "patent medicine" advertising is frequently lost sight of. The modern advertiser, in any line, is not so much concerned with letting the public know that he can supply what it legitimately demands, as he is in creating an artificial demand which he hopes to supply. As an advertising concern in Chicago says, in a circular letter sent to prospective clients:

> "It would be a liberal estimate to say that only 25 per cent. of the business transacted in this country each day is done as the result of a 'natural demand.' The other 75 per cent. is done as a result of salesmanship in one form or another—and it's on the 75 per cent. that we make our living and you make yours."

This, we believe, is no exaggeration. It means, in other words, that three fourths of the things purchased are bought not because the public normally wants them, but because, through skilful advertising, the public has been hypnotized into believing it wants them. It may be that in many lines of business this is legitimate. At any rate, it is conceivable that some reasonably convincing arguments might be made in favor of it. But in the matter of selling drugs for the self-treatment of ailments, such artificially created demands are not legitimate. They are directly against public interest because they are a menace to the public health.

The real object of "patent medicine" advertising — as all "patent medicine" advertisers know, although few will admit it — is not the simple one of telling the public what goods there are for sale. It has a much more subtle motive. Its real intent is to convince those who read the advertisement that they are suffering from certain ailments which can be cured by the preparation advertised. One "patent medicine" maker who was urging druggists to stock his "cure" for appendicitis, and presumably thought that he could be frank about it, said that unless his product was put on the shelf the druggist would have nothing to sell "to the man who has appendicitis nor to the vast multitude who THINK they have or are going to have this dread disease." Elaborating, the manufacturer reminded the druggist further, that "fully seventy-five per cent. of all cough and kidney remedies are bought by people who THINK they have consumption or some serious kidney ailment . . . and not by people who actually have them." That's it exactly! And it is the business of the "patent medicine" advertisement to play on the fears of those who are temporarily indisposed and make them think that they have this, that or the other disease which can surely be cured by Dr. Quack's Panacea.

What, then, is the remedy? That no medicine should be sold for the self-treatment of ailments? By no means. Were we living under ideal economic conditions, it might be as feasible as it may be theoretically desirable, that expert advice and opinion should be sought whenever anything went wrong with the human machine. Under present economic conditions, however, such a conception is Utopian. It is unthinkable that the average man is going to seek a physician's aid every time he becomes constipated. Instead, he is going to purchase a laxative medicine of some sort. It may be admitted, then, that there is today a legitimate place on the market for home remedies for the self-treatment of simple ailments. All that has been asked in the interest of public health and safety is that these remedies be sold under no misleading claims; that they contain no dangerous or habit-forming drugs, and that the names and amount of the active ingredients therein be declared on the label.

The public has a further right in the premises, although it has not awakened to this fact. It is justified in demanding that such remedies shall not be so advertised as to make for ill-health. "Patent medicine" advertising has for years been a stench in the nostrils of thinking men, lay and medical. It has been the black beast of the advertising world. Every effort made by decent advertisers in other lines of endeavor toward purifying the advertising field has had first to be directed against the "patent medicine" business. Yet, from the point of view of the public health, the advertising of home remedies, instead of being the

3. Bloor, W. R.: Jour. Biol. Chem., 1916, xxiv, 447. Pure Lecithin, editorial, THE JOURNAL A. M. A., April 1, 1916, p. 1029.
4. Howell, W. H.: Am. Jour. Physiol., 1912-1913, xxxi, 1. Hurwitz, S. H., and Lucas, W. P.: A Study of the Blood in Hemophilia, Arch. Int. Med., April, 1916, p. 543.

most exaggerated, the most suggestive and the most fraudulent, should, on the contrary, be even more conservative and respectable than the advertising of the ordinary products of commerce. It may or may not be a bad thing for the community, economically speaking, if the public is led, through skilful advertising, to buy more hats, more pianos or more automobiles than it can really afford or has any legitimate use for. But it requires no argument to prove that advertising which makes a well man think he is sick and a sick man think he is *very sick*, with the object in view of making these men drug themselves unnecessarily, is a crime against the public health.

AN ASSAULT ON THE HARRISON NARCOTIC LAW

That he may have a physician's prescription calling for one-quarter grain of morphin sulphate in a two ounce mixture refilled as many times as may be found necessary for medicinal purposes, and not be compelled to obtain a new prescription each time he desires a new supply, one Ashley of Washington, D. C., has filed a petition in the Supreme Court of the District of Columbia to compel the secretary of the treasury and the commissioner of internal revenue to abrogate certain treasury decisions under the Harrison Narcotic Law that run counter to his wishes. The petitioner sets forth that he is a poor man, suffering from a serious and stubborn cough, which has been troubling him for some time, and that he cannot afford to pay for having the prescription rewritten and has had to stop taking the medicine. Strangely there is nothing in the petition to gratify a natural curiosity as to the relative cost of having the prescription rewritten — provided there would be any additional cost, which is doubtful — as compared with the cost of contesting the issue with the secretary of the treasury and the commissioner of internal revenue; nor does the petition disclose what the petitioner is going to do for his serious and stubborn cough while waiting for the case to be settled.

The poor man's leading counsel is Eugene C. Brokmeyer, who, we understand, has been and probably still is attorney for the Coca-Cola Company. Mr. Brokmeyer is also the attorney for the National Association of Retail Druggists and is Washington correspondent for the official organ of the organization—the *N. A. R. D. Journal*. Section 6 of the Harrison Narcotic Law is a "joker" which exempts from the operation of the act "patent medicines" containing narcotics within certain amounts. Tacked on to Section 6 is a further "joker" which exempts from the provisions of the act "decocainized coca leaves or preparations made therefrom" and "other preparations of coca leaves which do not contain cocain." This last joker is said to have been fathered by Attorney Brokmeyer and its apparent object is to permit the use of what the Coca-Cola concern calls its "Merchandise No. 5" in preparing its "soft drink."

Section 6 of the Harrison Narcotic Law permits "patent medicine" makers and others to sell narcotics indiscriminately provided these narcotics are in preparations or remedies containing not more than one fourth of a grain of morphin to the fluidounce or containing other of the forbidden drugs in certain tolerated degrees of dilution.

The commissioner of internal revenue, with the approval of the secretary of the treasury, ruled that narcotic drugs dispensed under and in pursuance of a written prescription, no matter how diluted or attenuated they may be, do not come within the exemptions laid down in Section 6 of the law, and that such prescriptions cannot be refilled. An exception is made, however, with respect to such prescriptions as call merely for preparations and remedies that are themselves clearly within the scope of the exempting section, and in such cases, as the preparation or remedy might have been sold without a prescription even in the first instance, refilling of the prescription is allowed.

The petitioner in the present case tells the court that under the commissioner's ruling a person must consult his physician and obtain a new prescription every time he desires to have a prescribed narcotic mixture renewed, unless it be merely a ready-made compound with the exemptions established by Section 6. The petitioner is of the opinion that the decision discriminates in favor of the physician and against the poor man, who, he alleges, is compelled to pay the physician every time he desires a new supply of any prescribed narcotic mixture.

THE JOURNAL believes that the commissioner's ruling putting certain restrictions on the prescribing of narcotics by physicians, no matter in what degree of attenuation, is a sound one and in the interest of public health and safety. But THE JOURNAL also believes that Section 6 is wholly and indefensibly pernicious. It is true that the commissioner's ruling seems illogical when viewed in the light of the exemptions granted by Section 6. But that is the fault of the viciousness of the Section and is not due to any lack of foresight or wisdom on the part of the commissioner. It remains to be seen if, in the present suit, the court will uphold a ruling which is patently in the interest of public health and safety in spite of the fact that it is at cross purposes with a "joker" put in the same act by Congress, probably without realizing that it was in behalf of the "patent medicine" interests.

Priority in Scientific Work.—The international zoologic congresses have adopted as their regulation on this subject that scientific priority does not date from the day when an oral communication is made to some society, or a MS or drawings presented, but dates from the day when the printed work has been effectively published, that is, its distribution started, so that those interested can take cognizance of it.

Current Comment

THE PHOSPHORUS COMPOUNDS IN BLOOD SERUM

Along with the increasing knowledge of the detailed composition of the blood, and the possible significance of quantitative variations of the normal constituents,[1] has come a desire to make our information in this field as complete as possible. For this reason we refer here to a recent investigation by Greenwald[2] at the Harriman Research Laboratory, New York, on the nature of the phosphorus compounds of the serum. As an illustration of the significance which such a factor may assume, one recalls the recent work of Howland and his associates at the Johns Hopkins University, indicating that certain types of acidosis, particularly in children, depend very considerably on the failure of the kidneys to eliminate the phosphoric acid formed in metabolism, and its consequent accumulation in the blood. Phosphorus may likewise be present in blood in the guise of the phosphatids lecithin and cephalin, compounds which belong to the class of lipoids. Lecithin has been associated with all manner of reactions and processes, and is particularly conspicuous in nervous matter, while cephalin has been shown of late to play a facilitating part in blood coagulation as a thromboplastic substance. Greenwald[2] has found that the phosphorus compounds of serum consist almost exclusively of the phosphorus-containing lipoids — the phospholipins, as he terms them, following the nomenclature suggested by Gies — and inorganic phosphate. Traces of other forms of phosphorus compounds may be present; but the essential content of phosphorus is found in substances of the types mentioned. For all of them satisfactory analytic methods of estimation are now available.[3]

HYPERGLYCEMIA AND KIDNEY PERMEABILITY AFTER SURGICAL ANESTHESIA

The maintenance of surgical anesthesia seems to be attended with an increase in the sugar content of the blood. The percentage of sugar in the circulating fluid of the body may be more than doubled in the course of a comparatively brief surgical procedure, and the conditions which thereby arise in the blood are such as would lead one to expect an attendant excretion of sugar through the kidneys. A content of more than 0.2 per cent. of blood sugar is not an infrequent observation in the surgical clinics at the end of an operation.[1] This is a condition not unlike that which attends the genesis of glycosuria in the diabetic; yet sugar occurs only occasionally in the urine after operation, about one in fifty cases showing traces.[1] If the observed hyperglycemia represents an actual increase in the amount of sugar in the blood, why does glycosuria fail to develop after surgical anesthesia although it makes its appearance at many other times? An explanation of this seeming contradiction has been furnished by the observations of Epstein, Reiss and Branower[2] at the pathologic department of Mount Sinai Hospital, New York. Selecting cases representing simple surgical conditions in which no evidence of renal disease could be found, they compared the functional capacity of the kidneys before and after operations. One of the effects of the surgical procedures common to all the cases studied was a marked diminution in the amount of urine secreted. This is believed to be due undoubtedly in part to the withholding of food from the patient prior to the operation, and to the loss of fluid from the body by sweating during the operation. Postoperative vomiting may also contribute to the loss of fluid. In any event, however, there was a uniform delay in the time of the appearance of phenolsulphonephthalein—the dye used in testing renal function—and a decrease in the amount excreted. In some cases the reduction was very striking. The quantitative decrease after operation ranges from 12 to 73 per cent., the average being about 25 per cent. The New York investigators thus correlate operative procedures under anesthesia not only with an increase in blood sugar content (a hyperglycemia), but also with a reduction or impairment of renal function. From this it is concluded that diminished permeability of the kidneys is responsible for the infrequent elimination of sugar after operations under circulatory conditions in which glycosuria might be expected.

THE SOLUBILITY OF URIC ACID IN URINE

The marked variations in the apparent solvent power of different normal human urines for uric acid has for many years furnished a puzzle to those interested in the biochemistry of the subject. Obviously the total output of uric acid in a given period — a factor dependent in turn on the character of the diet in respect to the abundance or paucity of purin-yielding foods — plays some part in the ability of a given volume of urine to dissolve this compound. Quite aside from this quantitative aspect, however, it has long been apparent that the tendency for urates or uric acid itself to separate as a sediment out of secreted urine is dependent on something further than the total quantities of this purin derivative to be dissolved. It has become more evident in recent years that the reaction of the urine takes a dominant place in the establishment of conditions favoring or opposing solubility, as the case may be. The researches of Hindhede[1] and of Blatherwick[2] in particular have indicated how variations in the intake of acid or base producing components of the diet may lead to corresponding changes in the reaction of the urine and its consequent solvent power for uric acid. It would be helpful as well as

1. Compare The Lipoids ("Fats") of Human Blood, editorial, this issue, p. 956.
2. Greenwald, I.: The Nature of the Acid-Soluble Phosphorus of Serum, Jour. Biol. Chem., 1916, xxv, 431.
3. Greenwald, I.: Jour. Biol. Chem., 1913, xiv, 369; ibid., 1915, xxi, 29; Am. Jour. Med. Sc., 1914, cxlvii, 225; Jour. Biol. Chem., 1916, xxv, 431. Howland, J.; Haessler, F. H., and Marriott, W. McKim.: Jour. Biol. Chem., 1916, xxiv, 18. Bloor, W.: Jour. Biol. Chem., 1915, xxii, 133; ibid., 1916, xxiv, 447; ibid., xxv, 577.

1. Epstein, A. A., and Aschner, P. W.: Jour. Biol. Chem., 1916, xxv, 151.
2. Epstein, A. A.; Reiss, Joseph, and Branower, Jacob: The Effect of Surgical Procedures on Blood Sugar and Renal Permeability, Jour. Biol. Chem., 1916, xxvi, 25.

1. Hindhede, M.: Skand. Arch. f. Physiol., 1912, xxvi, 384.
2. Blatherwick, N. R.: The Specific Rôle of Foods in Relation to the Composition of the Urine, Arch. Int. Med., September, 1914, p. 409.

interesting to discover all of the main factors on which the uric acid dissolving power of the urine depends, so as to be able on the basis of certain data to foretell approximately how much uric acid would be dissolved by a particular urine. Studies by Haskins[3] have furnished at least a partial solution. According to him, and in confirmation of other observers, some urines that are slightly acid and all those that are neutral or alkaline dissolve extra uric acid. On the other hand, Haskins has found that the solvent power of urines of ordinary concentration is distinctly increased by dilution. For instance, the total uric acid dissolved by 100 c.c. of urine after being diluted with 300 c.c. of distilled water may be even twice as much as that dissolved by 10 c.c. of the undiluted urine. Otherwise expressed, dilute urines, when considered in proportion to their concentration, show much greater solvent power than less dilute urines. Sometimes urines show signs of apparent supersaturation with uric acid. They dissolve so much of the substance that they come to contain more than is present in a saturated solution of monosodium urate. Urines passed after sodium bicarbonate or citrate has been taken may behave in this way. Haskins inclines to the belief, already intimated by others, that in all probability, in these cases at least, part of the uric acid is in colloidal solution in a form "stabilized," it may be, by colloids in the urine.

EVEN THE EGGS MAY BE INFECTED

According to a Census Bureau estimate the egg industry furnishes an average of 210 eggs per year or 4 eggs per week for each person in the United States. Their annual value at the point of production is over $300,000,000. These statistics explain the widespread interest in all facts pertaining to eggs either with respect to their production, marketing, or dietary uses. Why a product so carefully packed away in a well lined shell should become infected and undergo deterioration so easily has been a puzzle to many persons. It is not generally understood that a certain amount of bacterial infection may be found even in freshly laid eggs. Of more than 2,500 fresh eggs examined at the Rhode Island Experiment Station over 8 per cent. showed bacterial infection in the yolk.[1] None of the whites examined showed infection. The percentage of infection obtained for individual hens per year varied between 2.8 and 15, the average being 9. No hen laid all sterile eggs during any full year. The percentage of infection for infertile and for fertilized eggs was essentially the same. The invading organisms occurring included 40 bacterial types, among which were 11 cocci, 28 rods, and 1 spirillum. The most probable source of primary egg infection is the ovaries of the fowl, which become infected by bacteria escaping through the intestinal wall into the portal circulation. The nature of the bacterial species occurring in the primary infection makes clear the fact that primary infection plays no rôle in bringing about the decomposition of eggs. For the factors determining this result we must look mainly to the secondary infections. The nature and extent of the normal primary infection stands in no causal relation to embryo mortality in incubating eggs, and losses in "dead-in-shell" eggs can not be explained on these grounds.

3. Haskins, H. D.: The Uric Acid Solvent Power of Normal Urine, Jour. Biol. Chem., 1916, xxvi, 205.

1. Hadley, P. B., and Caldwell, Dorothy W.: The Bacterial Infection of Fresh Eggs, Rhode Island Experiment Station Bull., 1916, No. 164, p. 3.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

COLORADO

Sanatorium Opened.—The new hospital building of the Modern Woodmen of America, Woodmen, was formally opened, September 16. A reception to physicians was held at 4 o'clock. There was a clinic inspection an hour later, and at 7 o'clock the culinary department of the institution was inspected. Dr. James A. Rutledge is medical director and superintendent of the institution.

New State Society Officers.—At the forty-sixth annual meeting of the Colorado State Medical Society, held in Glenwood Springs, the following officers were elected: president, Dr. Alexander C. Magruder, Colorado Springs; vice president, Dr. William W. Frank, Glenwood Springs, and secretary, Dr. Crum Epler, Pueblo (reelected). It was decided to hold the 1917 meeting in Colorado Springs.

Personal.—Dr. John G. Locke, Denver, was elected surgeon-general of the Conference of Foreign Wars of the United States at its annual meeting held in Chicago, August 17.——Dr. Leslie H. Wade, formerly of Battle Creek, has been appointed a member of the Boulder Colorado Sanitarium.——Dr. Frank R. Coffman, deputy city health commissioner of Denver, has resigned.——Dr. Crum Epler, Pueblo, secretary of the Colorado State Medical Society, is ill with diphtheria and under treatment at St. Mary's Hospital.

DISTRICT OF COLUMBIA

Poliomyelitis in the District.—During the week ending September 16, no case of poliomyelitis was reported.

Emergency Hospital Changes.—Dr. Harry S. Lewis, superintendent of the Central Dispensary and Emergency Hospital for the past six years, has resigned, to take effect October 1. Dr. Lewis will enter private practice.——Dr. A. Magruder MacDonald of the house staff has been appointed medical director, to succeed Dr. Lewis in the discharge of his medical duties. It is planned to appoint an administrative officer to take over the business affairs of the institution.

IDAHO

Change in Medical Board.—Dr. W. F. Pike, Twin Falls, has been appointed a member of the Idaho Board of Medical Examiners for a term of six years, succeeding Dr. Clifford M. Cline, Idaho Falls, resigned.

ILLINOIS

Eugenic Law.—State Senator Glackin is framing a bill providing for physical and mental tests of those who desire to marry. The president of the Cook County board and Dr. Adam Szwajkart, county physician, have promised their cooperation.

Sanatorium Well Under Way.—Progress on the Rock Island Municipal Sanatorium has been rapid; six tents have already been erected and four more will soon be ready. The main building is being remodeled, a 12-foot veranda is being built entirely around the building, and a 30-foot section of the veranda is to be enclosed in glass, and the entire veranda screened.——An open air school to accommodate forty pupils is being established by the Rockford Tuberculosis Sanatorium.

Personal.—Dr. S. Claude Andrus, Rockford, has been appointed local surgeon for the Burlington System, succeeding Dr. William R. Franklin, deceased.——Dr. John J.

Rendleman, Cairo, was elected president of the Rendleman Family Reunion at the annual meeting of the family, at Alto Pass, September 10.——Dr. Austin J. Brown, Vienna, who was shot in the head by Thomas Hester, September 1, is still under treatment at St. Mary's Infirmary, Cairo, and is not materially improved. The bullet penetrated the skull, and was removed from behind the right ear.——Dr. William G. Hawkey, Belvidere, is a candidate for nomination as coroner of Boone County.——Dr. George M. Manning, Garden Prairie, has sold his practice and will move to Kansas.

Typhoid in Elgin.—The inspector for the state board of health, after careful investigation of the typhoid situation in Elgin, states that since the last week in June, when the first case was reported, there have been eleven deaths from the disease and that at present there are 175 cases in the city; that the epidemic was due to pollution of the water supply, whose source is artesian springs, by infected water from the Fox River. The Elgin Watch Company, as soon as it received information regarding the matter, took steps to correct the defect and also did everything possible for its employees, who were the principal sufferers. It is said that the delay in taking measures to prevent the spread of the disease was due to the fact that the health officer, who is not a physician, failed to appreciate that the reports of cases which were sent to him were anything more than matters of routine. Not until August did the condition receive attention, when Dr. Alban L. Mann, who is in charge of the city laboratory, discovered typhoid bacilli in a specimen sent to him for examination. He immediately took steps to ascertain the cause and to limit the spread of the disease.

Chicago

Hospital Fund Campaign.—The Norwegian Lutheran Deaconess Home and Hospital announces that it will launch next month a twelve-day campaign to raise about $150,000 for the erection of a new five-story wing, and for a fifth story addition to the wing built in 1912.

Tuberculosis Society Meeting.—The twenty-first meeting of the Robert Koch Society for the Study of Tuberculosis will be held at 12:15 p. m., September 28, in Parlor B, Hotel Morrison. Dr. Robert H. Babcock will speak on "Some Points in Diagnosis and Management," and the president, Dr. John Ritter, will discuss "The Future of the Robert Koch Society."

Pupils as Health Officers.—Health Commissioner Robertson has suggested to the president of the school board that a student be elected by and for each of the public schools, to act as a health commissioner and to cooperate with the principals, teachers and the department of health in maintaining a neat, orderly and sanitary condition about the school and to supervise the distribution of health literature.

Memorial for John B. Murphy.—The John B. Murphy Memorial Association was incorporated in Springfield, September 19, by Drs. William A. Evans, James E. Keefe, Allan B. Kanavel, Frank H. Martin and Frank Crozier. The first step to be taken by the association is to raise half a million dollars, which it has been decided to expend on the memorial. The two requisites of the memorial are said to be that it be permanent and that it be a "living power making for the advancement of surgery on both the scientific and moral sides."

KENTUCKY

Personal.—Dr. Thomas R. Welch, Nicholasville, has been elected secretary of the state tuberculosis commission, succeeding Dr. Col. L. Mervin Maus, M. C., U. S. Army, retired.

Hospital Notes.—The new Carroll County Infirmary, erected at a cost of $10,000 on the Carrollton-Owenton turnpike near Guerrant, is completed and ready for equipment. ——The sanatorium of Dr. Milton Board and the Louisville Neuropathic Sanatorium have consolidated, and will be under the charge of Dr. William E. Gardner. Dr. Board, who retires from the sanatorium, was recently appointed medical examiner of the workman's compensation commission.

MAINE

Personal.—Dr. James F. Faulkner, Gardiner, has returned after several months' service with the Second Harvard Surgical unit at the war front.

Opposition to Medical Examiners' Bill.—The state association of county commissioners, at its recent meeting at Augusta, opposed the medical examiners' bill, and suggested that if the law were appealed a statute should be substituted giving authority to sheriffs and local physicians to handle the cases which under the present law are in the care of the medical examiners.

MARYLAND

Paper Cup Order Enforced.—The order from the state board of health requiring soda water and other soft drinks to be sold in paper cups or sterilized glasses, also prohibiting the use of spoons that have not been sterilized, is in effect. The penalty is a fine not exceeding $500. Inspectors are making a rigid investigation to see that the law is enforced.

Personal.—Dr. William H. Welch, head of the new Hygiene Institute at the Johns Hopkins Hospital, will leave England for home, September 20. Dr. Welch left for England five weeks ago to obtain data in connection with the organization of the Hygiene Institute, which was made possible through a gift from the Rockefeller Foundation.——Dr. Alfred W. Brown, medical superintendent of the Public Athletic League, Baltimore, for three years, has resigned and will practice in British Columbia.

Public Health Service Aids in Infantile Paralysis Campaign.—To prevent the spread of infantile paralysis, the United States Public Health Service has sent to Baltimore, at the request of the state and city health departments, Passed Asst. Surg. James R. Hurley, Asst. Surg. C. H. Waring and seven scientific assistants. Dr. Hurley is in charge and has his headquarters at the health department. It was stated at the public health service that the federal health experts do not regard the situation in Baltimore and Maryland as being critical, but they think it best to grant the request of the state and city authorities for a detail of federal experts to help them fight the malady before it gets a firm foothold. There has been a decided increase in the number of patients reported this week and for this reason Health Commissioner John D. Blake is undecided as to whether he will permit schools to open on September 25, as was decided on three weeks ago. Dr. Hurley has taken charge of the interstate travel phase of the situation, and has announced that no children under 16 years of age will be permitted to leave the city for points outside the state without the United States Public Health Service certificate. In addition to issuing travel certificates, Dr. Hurley has assistants at the railroad depots and steamboat wharves to look after through passenger traffic, and a careful watch is being made for persons evading quarantine restrictions by the use of automobiles. There has also been a decided increase in the number of cases reported from the various counties throughout the state. Sixty-seven positive cases have been reported in the city this year, practically all since July 1, and there have been twenty-seven deaths. Thirty-eight patients are now under treatment, the majority being at the Children's Hospital School.

MICHIGAN

Physician Wins Malpractice Suit.—A suit against Dr. A. M. Wilkinson of Charlevoix to recover for alleged improper treatment of a severe burn of the hands of a 17 months old child, was tried in the circuit court last week and after three days, the jury brought in a verdict "no cause of action." This is the second time suit has been brought against Dr. Wilkinson in this case. The first suit was entered in the name of the father, but the plaintiff's expert refused to testify; the second was instituted in the name of the child with the father as the next friend.

MISSOURI

Medical College Closed.—It is reported that the Southwest School of Medicine and Hospital, organized last year following the closing of the Kansas City Hahnemann Medical College, has disposed of its equipment and will not be reopened.

Personal.—Dr. Frederick B. Kyger, chief of the inspection corps of the Kansas City public schools, resigned, September 5.——Dr. Edward F. Higdon, Richmond, has been appointed assistant physician at State Hospital, No. 2, St. Joseph. ——Dr. Daniel R. Hill, physician for the Jasper County public health board, has resigned the care of the clinic and free sanatorium in Webb City.——Dr. Floyd H. Spencer, St. Joseph, has been appointed acting coroner of Buchanan County.——Dr. William S. Culpepper, Willow Springs, has been appointed division surgeon for the Frisco Railroad at Willow Springs, succeeding Dr. Hilliard J. Rowe.

St. Louis

Waste Paper Sold for Tuberculosis Benefit.—The St. Louis Tuberculosis Society has collected and sold nearly 1,000,000 pounds of waste paper during the last six months.

Personal.—Dr. Leon F. Shackell of Washington University has been appointed an instructor in physiology at the University of Utah Medical School, Salt Lake City.——Dr. Fred B. Abbott has returned after six months' experience on the war front in France as a member of the Harvard Surgical Unit. ——Dr. James R. Clemens has been elected dean of the John A. Creighton Medical College, Omaha.——Dr. Cleveland H. Shutt has been reappointed health commissioner of St. Louis. ——Dr. Scott Heuer sailed from New York, July 30, on the *Lafayette* to join the American Ambulance staff in Paris.—— Dr. Charles L. Wilson announces his retirement from the practice of medicine.

NEBRASKA

State Secretaries Organized.—At a meeting of the board of health secretaries, held at Lincoln recently, reorganization was effected, with the following officers: president, Dr. Charles T. Burchard, Falls City (reelected); vice president, Dr. Herschell B. Cummins, Seward; secretary, Dr. E. Arthur Carr, Lincoln, and treasurer, Dr. Lucien Stark, Hartington.

St. Joseph's Hospital Day.—The Commercial Club of Alliance and the Box Butte County Medical Society united in securing a special attraction for the meeting of the society held in Alliance, September 15. The program was especially in honor of St. Joseph's Hospital, Alliance, and included a luncheon given by the medical society and the Commercial Club, at which Dr. Herbert A. Copsey presided as toastmaster. A public meeting was held in the afternoon at which John W. Guthrie delivered an address on St. Joseph's Hospital, and Dr. Palmer Findley, Omaha, spoke on "The Popular Heroes of Medicine." A banquet was given by the hospital committee of the Alliance Commercial Club to the medical society and visiting physicians at which the oration in medicine was delivered by Dr. Arthur D. Dunn, Omaha, on "Syphilis in Relation to Internal Medicine," and the oration in surgery was given by Dr. Palmer Findley on "The Cancer Problem, with Special Reference to Cancer of the Uterus."

NEW YORK

Personal.—Dr. Hermann M. Biggs, state commissioner of health, was successfully operated on at Rochester, Minn., for chronic appendicitis and gallstones, September 14.——Dr. Charles W. Pilgrim, superintendent of the Hudson River State Hospital, has been appointed president of the state lunacy commission.

Paratyphoid at Camp Whitman.—There are 4,500 men in quarantine at Camp Whitman. There is one positive case of paratyphoid fever in the hospital of the Third Infantry, two others are thought to have the disease and there are seventeen suspects from the Fourteenth Infantry. In order to make provision for the examination of the militiamen a laboratory unit of the state department of health has been established at the camp in cooperation with the army medical officers. Dr. Augustus B. Downing, director of the laboratories of the department, is in charge. General vaccination of the troops has been begun by a staff of twenty-two physicians.

Physical Training Program Adopted.—The state board of regents, while in session at Syracuse, gave its unanimous approval of the physical training program for the schools of the state, as recommended by the state military training commission. This program calls for all the minimum time to be devoted to physical training in the schools which is prescribed by law, that is, an average of twenty minutes a day, or 100 minutes a week. The general plan is the most comprehensive health education and physical training program ever adopted by a state. A statement issued by the regents shows that every feature is already in successful operation in some of the most progressive schools of the state.

New York City

Personal.—Dr. Arthur Ginnever has returned home after a two months' tour of inspection of the military hospitals in France in the interests of the British War Relief Association in this country.——It is reported that Dr. Joseph A. Blake, formerly of this city, who is now head of the American Ambulance at Neuilly, is ill in the hospital.——Dr. Roy S. McElwee has returned from Germany.

Dental Schools Consolidate.—A plan has been adopted whereby the New York School of Dental Hygiene has become allied with the Columbia School of Dentistry, recently established and affiliated with the College of Physicians and Surgeons. The school will open, September 27, in the Vanderbilt Dental Clinic. The Rockefeller General Education Board has given the school of dentistry $2,500. The administrative boards of the two schools are practically identical.

Infantile Paralysis.—The reports of the health department for the week ending September 16 do not show the reduction in the number of cases of infantile paralysis that had been expected. There were forty-one new cases reported on Friday and Saturday of this week, whereas earlier in the week the new cases averaged about thirty-one daily. The total number of cases thus far since the outbreak of the epidemic is 8,731, with 2,172 deaths. This increase in the number of cases has influenced the United States Public Health Service to continue its work of inspection of travel as long as present conditions continue.——It is stated that public health officials are inclined to consider October 2 a safer date for opening schools than September 25.——Fifty of the 100 monkeys brought from the Orient for research work in connection with the study of poliomyelitis are on their way from San Francisco to the Rockefeller Institute. The remainder of the monkeys have died from lung trouble since arriving in this country.

Sanitary Survey of Office Conditions.—The August *Bulletin* of the department of health gives the results of a series of investigations of an office block in the downtown district of the city which was undertaken with the purpose of establishing certain facts regarding the conditions under which office employees are obliged to work in certain sections of this city. All the details with reference to the construction and character of the buildings were recorded, the methods of ventilating, lighting, heating, cooling, cleaning, character of plumbing, kind of business carried on, number of employees, etc., were investigated, and account was taken of welfare, relief work and all conditions surrounding the workers which could be considered as giving data from which general conclusions could be drawn. Among the most interesting points brought out were those regarding the character and quality of light and the amount of ventilation found. The percentage of those using artificial light was found to be 85.33, while only 14.67 were using natural light. It was found that much attention was bestowed on the esthetic effects in lighting and very little to the physiologic effects. There was evidently no standard as to the quality or quantity of light furnished to employees. The two greatest deficiencies were insufficient light and too much artificial light. As to ventilation it was shown that there was quite a sufficient quantity of floor space available for ventilating, but that it was not in use. About 18.6 per cent. of the individuals in this block did not have a sufficient quantity of floor space allotted them. The average temperature of the offices was found to be from 2 to 3 degrees too high, while the humidity showed an enormous reduction in comparison with that of the outside atmosphere. The report states that there is no doubt that the rapid change from the conditions indoors to the outside is largely responsible for the prevalence of catarrhal conditions of the mucous membrane of the nasopharynx.

NORTH DAKOTA

Bristol Resigns.—Dr. Leverett D. Bristol, in charge of the state public health laboratory, Grand Forks, has resigned to accept a teaching position in the department of public health and preventive medicine at Harvard University. He will also be a member of the staff of the Boston Dispensary.

Hospital Notes.—The Dunn County Hospital Association has been incorporated with the view of locating a hospital at Dunn Center to cost $50,000. It is proposed to immediately erect a temporary frame structure for present use and to proceed with the erection of the new hospital early in the spring.——Plans for the new addition to the St. Luke's Hospital, Fargo, are completed and the work of construction will begin shortly. The new building is to be constructed in the rear of the present building, and will double the capacity of the institution.

OHIO

Personal.—Dr. Robert G. Paterson, Columbus, has resigned as director of the department for the study and prevention of tuberculosis for his old position as secretary of the Ohio State Society for the Cure and Prevention of Tuberculosis. ——Dr. Diego Delfino, Alliance, has been ordered to report for service as surgeon in the Italian army.——Dr. Charles H. Merz, has been elected president of the Erie County Automobile Club.——Dr. Erl A. Baber has been appointed superintendent of the Dayton State Hospital.——Dr. Thomas A. Dickey has been appointed president of the board of trustees of the Middleton Hospital.

PENNSYLVANIA

New Hospital Opens.—A new emergency hospital for the treatment of infantile paralysis has been opened in Rosemont. It is to be conducted as an emergency ward of the Bryn Mawr Hospital and will be utilized for the treatment of infantile paralysis originating along the "Main Line." Dr. Reynolds of the Bryn Mawr resident staff is in charge of the new institution.

Personal.—Dr. Archibald W. Dunn, Willow Grove, has been appointed professor of physiology and biology in the American College, Peking, China.——Dr. Samuel A. Leinbach has been appointed president of the Quakertown Board of Health.——Dr. Charles E. Roderick has resigned from the staff of the Hazleton State Hospital, to take charge of the new laboratories of the Florida State Board of Health at Tampa.——Dr. William B. Beaumont has been appointed local surgeon for the Lehigh Valley Railroad at Laceyville.

Philadelphia

Personal.—Dr. Alexander Johnson, for thirteen years secretary of the National Conference of Charities and Correction, has been selected as the expert for the Colorado State Survey Commission to investigate and make recommendations concerning the care of mental defectives and insane in the state, and the charities and corrections departments of the state. ——Dr. Julius E. Foerenbach has been appointed assistant medical inspector.

Campaign for Clean Streets.—A campaign for cleaner streets is being urged by various medical societies, civic associations and business men's organizations throughout the city. The Walnut Street Business Men's Association has recently joined in this general protest. At a special meeting of this association, September 14, the association urged the prosecution and fining of owners of unoccupied properties, particularly in the district bounded by Race and South streets and the Delaware and Schuylkill rivers.

Food Vendors Fined.—In the general health crusade for cleaner and better food which is being waged by the bureau of health and sanitation, vendors of fruit, cakes, meats and vegetables who display their wares uncovered, an action violating the present laws, have been forced to display their goods either in glass cases or covered by netting. Inspections are made by representatives of the health department daily throughout the city and a great many dealers who have not heeded the law have been fined. Several were held under bail ranging from $400 to $600.

Infantile Paralysis Decreasing.—The epidemic of infantile paralysis which has been sweeping this section of the country shows an abatement in Philadelphia and Pennsylvania, and also in the neighboring cities. Ten new cases with one death were reported in Philadelphia, September 16. The new cases in the state outside of Philadelphia totaled nine, and the new cases recorded throughout the adjoining state of New Jersey, on September 16, aggregated thirty-three. The total number of cases reported to the state health department on September 14 from July 1 was 1,231; 535 of these occurred outside of Philadelphia and during the period mentioned 305 deaths have occurred. An additional appropriation of $70,000 to carry on the campaign against the disease will be asked for from councils by Director Krusen, September 21. The director also makes an appeal for blood from persons who have had the disease. A committee has taken in charge the work of raising funds to administer after-treatment to the victims of this malady. One hundred patients are now being cared for by the Episcopal Hospital and the Wynnefield branch of the Children's Hospital. The Jefferson Hospital has offered fifteen free beds, the Mary Drexel Home, six, the University of Pennsylvania Hospital, 14, and the Frankford Hospital, six. Thirty-six convalescents are now ready to leave the Municipal Hospital and receive this important after-care.

CANADA

Personal.—Dr. George D. Porter, Toronto, was reelected secretary and Senator John W. Daniel, M.D., St. John, N. B., was reelected president of the Canadian Public Health Association at the annual meeting held in Quebec City, September 13 and 14.——Maj. George T. McKeough, M.D., Chatham, Ont., has returned from England, where he was a member of the medical boards at Folkestone and Bramshott.——Capt. J. Harry McPhedran, Toronto, who has been appointed to the pension board under Lieut.-Col. P. Walter McKeown, Toronto, is returning to Toronto on two months' leave of absence.

Tuberculosis Among Canadian Troops.—The Dominion Hospitals Commission has arranged for a conference of experts on tuberculosis in Ottawa to deal with the question of tuberculosis among the Canadian troops. Dr. Alfred Thompson, M. P., Yukon, the chief medical officer of the commission, is to be presiding officer, and those who have been called to the conference are: Dr. Edward R. Baldwin, Saranac Lake, N. Y.; Dr. Charles D. Parfitt, Calydor Sanatarium, Gravenhurst, Ont.; Dr. Jabez H. Elliott, Toronto, and Dr. John R. Byers, Ste. Agathe-des-Monts, Que. These experts will be asked to advise the commission regarding the location of sanatoriums, the most recent methods of treatment, diet and exercise, the maximum and minimum capacities of sanatoriums, as well as other questions pertaining to the disease. There are already 370 tuberculous soldiers in the sanatoriums of the various provinces, and of these 175 have been overseas. Of those who go overseas about thirty Canadians return to Canada every month affected with the disease.

The Returned Soldiers and Tuberculosis.—The Canadian Hospitals Commission has presented reports bearing on the question of tuberculosis and other disease conditions in returned soldiers. A deputation from the Muskoka institutions has waited on the commission and discussed with them the question of increased accommodation to take care of soldiers in those institutions. The matter was left in the hands of the medical superintendent and to committees for Ontario and Quebec, which will call to their assistance certain experts in order that the commission may outline a definite policy which will deal permanently with the situation. The present number of men, tuberculous patients, in the various sanatoriums in Canada is 370, of whom 175 have been returned from overseas. With regard to the other institutions, the various convalescent homes, there are at present 368 overseas patients, 269 nonoverseas, and from 700 to 900 outpatients who are receiving treatment. According to the latest returns from the director of the medical service for Canada and England, there were, August 4, 12,900 Canadian inmates in Canadian and other hospitals, sixty-three being in special sanatoriums. The percentage from loss or wastage has been reduced from about 80 per cent. to about 17 per cent. This is said to have been brought about by a system of physical drill which has been established, and a similar system is now being established in the convalescent homes and hospitals in Canada, three being at present operating in Montreal, Kingston and London. Negotiations are in progress whereby the new hospital for the insane at Whitby, Ont., may be handed over, by the Ontario government, for returned soldiers.

University News.—At a recent meeting of the governors of the University of Toronto, warm reference was made to the late Dr. Thomas G. Brodie, professor of physiology, as "one of the leading experimental physiologists in the English speaking world." Deep regret was also expressed at the great loss the university has sustained.——The reduction in fees, owing to about one half of the students having volunteered for overseas service, will result in the governors having to face for the past fiscal year a deficit of $130,000. The total annual budget of the university is about $900,000, and the greatest economy will be practiced in the ensuing year in order that the financial condition of the institution may be bettered.——Great advances have been made in the facilities for students to follow postgraduate work, and definite new groups and classes will be hereafter followed as in undergraduate work. New fellowships have been added. The value of each is $500 for one year with free tuition, and these may be renewed for a year. There are also special departmental fellowships in political science, anatomy, and medicine and also the American Alumni Research Fellowship.——Patriotism has greatly affected the attendance in the past two years. All the faculties, however, will continue work as usual during the session of 1916-1917, although the attendance at the university will be very much lower than heretofore. In medicine, the registrar's office reports many inquiries from prospective entrants. The senior years in medicine have not been drawn on nearly so much as in other departments because a graduate is more to be desired than an undergraduate in war work.——A new gymnasium has been completed during the past year, and a woman's residence and union have been acquired.

GENERAL

Aid for Belgian Physicians.—The report of the treasurer of the committee of American physicians for the aid of the

Belgian profession lists no contributions for the month of August.

Previously reported receipts	$7,946.86
Previously reported disbursements:	
1,625 standard boxes of food at $2.20	$3,575.00
1,274 standard boxes of food at 2.30	2,930.20
353 standard boxes of food at 2.28	804.84
Total disbursements	7,310.04
Balance	$ 636.82

F. F. Simpson, M.D., Treasurer,
5 Jenkins Arcade Bldg., Pittsburgh.

Bequests and Donations.—The following bequests and donations have recently been announced:

Home for Orphans and Friendless Children, Neffsville, Pa., $2,000, and Philadelphia Home for Incurables, $1,000, by the will of Mrs. Mary S. Geiger, Philadelphia.

Brownsville (Pa.) General Hospital, between $1,500 and $2,000, as the result of a tag-day campaign, September 4.

St. Christopher's Hospital, Philadelphia, $2,500; Presbyterian Hospital, and Rush Home for Consumptives, each $5,000, by the will of Eugene I. Sauter.

St. Christopher's Hospital, Philadelphia, for the endowment of a free bed, $5,000, and Philadelphia Day Nursery, $1,000, by the will of Theresa Scott.

Prize Awarded Four Times to Lloyd.—At the annual meeting of the American Pharmaceutical Association at Atlantic City during the week of September 4, the Ebert prize was awarded to Prof. John Uri Lloyd for his discoveries in the colloidal precipitation of alkaloids by fuller's earth. This prize is awarded by the association to the member who presented the most meritorious paper at the previous annual meeting. Professor Lloyd has received this prize four times.

Florida and Alabama Physicians to Meet.—Physicians of West Florida and Southern Alabama will meet at the invitation of the Escambia County Medical Society at the state laboratory at Pensacola, October 25 and 26. On each day there will be a scientific session from 9 to 11 o'clock. Clinics will be held from 11 to 1, and in the afternoon entertainments of various kinds will be provided by the hosts.

Railroad Service Men's Meeting.—The fourteenth annual meeting of the Pacific Railway Surgeons Association was held at the Palace Hotel, San Francisco, August 25 and 26, under the presidency of Dr. Hiram W. Fenner, Tucson, Ariz. The following officers were elected: president, Dr. William T. Cummins, San Francisco; vice presidents, Dr. James A. Ketcherside, Yuma, Ariz., and Alvin Powell, Oakland, Calif.; secretary, Louis P. Howe, San Francisco, and treasurer, Ernest M. Keys, Alameda, Calif.

Medical Association of the Southwest.—The eleventh annual convention of this organization will be held in Fort Smith, Ark., on October 2, 3 and 4, under the presidency of Joseph D. Brecton, Greenville, Texas. Dr. John Ridlon, Chicago, will conduct a clinic on congenital dislocation of the hip, and Fenton B. Turck, New York, will demonstrate his work on diseases of the stomach. The three divisions will be devoted to papers, discussions and clinics.

WAR NOTES

Third Red Cross Unit Sails.—Dr. Daniel Fiske Jones, Boston, sailed for Liverpool, August 17, on the *Lapland* in charge of the third Harvard Red Cross Unit, twenty-two in number, who go to work in the British hospitals on the west front to replace the first and second army units.

Work of Murphy Unit Completed.—The hauling down of the American Flag, which marked the location of the field hospital established by the late Dr. John B. Murphy on the western front, is due, it is explained, to the fact that the work for which the hospital was established has been completed and that the surgeons and nurses have returned to America. It has therefore been turned over to a staff of English surgeons and nurses.

FOREIGN

Leprosy in Sardinia.—A ward in the public hospital at Cagliari has been set apart for lepers with open lesions and when strict and certain isolation cannot be counted on at home. The prefect ordered notification of every case of leprosy at whatever stage it may be, and the university clinic for skin diseases will then take necessary steps to isolate the patient if needed, with disinfection of the dwelling, periodical surveillance of the family and removal of the children from the close environment of the leper.

Prize for Milk Container.—According to the *Annali d'Igiene* of Palermo the local authorities at Bologna have offered a prize of 250 lire ($50) for a small glass container for milk to be delivered at the home and for a large metal container for milk in bulk. The method of closing the containers must be economical, practical and hygienic, and offer the best guarantees against fraud.

Deaths in the Profession Abroad.—V. Gilbert, a leading physician and sanitarian of Geneva, Switzerland. For some years he had been chief of the medical staff connected with the federal railway system, president of the Société médicale de Genève, and author of numerous articles on autoserotherapy in pleurisy, on tuberculosis, etc. He has had charge of the transportation and distribution of most of the disabled, sick and wounded soldiers sent to be interned in Switzerland. ——A. Charpentier, professor of medical physics at the University of Nancy, aged 64. His research and publications have been devoted almost exclusively to the physical and physiologic attributes of light. Some of his works, notably, "Vision from the Standpoint of General Medicine," and instruments devised to facilitate his research were awarded prizes by French societies——Dr. Tedeschi, physician in chief of the colonial forces in the French army.

Russian Chemicals and Drugs.—Professor Maecel Lauwick of Ghent University, Hon. Secretary of the Société d'Etudes Belgo-Russes, reports that many commercial organizations were founded in Russia last year for the manufacture of chemicals and drugs. They were twenty in number, against sixteen in 1914, with a capital of $12,000,000, against $4,500,000 in 1914. Previous to the war the home production of benzol was only about 50,000 pounds (500 tons); imports came exclusively from Germany. Russia has constructed many new coke ovens. Odessa is now a center of chemical industry, particularly for sodium salts, iodin, iodoform, copper sulphate, bichlorid of mercury, chloroform, chloral hydrate, etc. Among other products being made in Russia are formaldehyd, hexamethylenamin, lanolin, tannin, morphin, caffein, atropin, etc. Before the war the Russian market was entirely dependent on Germany for instruments. In 1913 Russia imported from Germany $250,000 worth of surgical instruments and over $2,000,000 worth of scientific and chemical apparatus. A factory for surgical instruments was constructed during the first weeks of the war at Pavlovo, near Moscow. The value of the production last year was about $500,000, the prices being 30 per cent. cheaper than those of goods imported from abroad.

PARIS LETTER

Paris, July 13, 1916.

The War

TREATMENT OF WAR WOUNDS

At the Réunion médico-chirurgicale de la V-e Armée, Dr. Lemaitre gave an account of the various stages of his surgical experience since the commencement of the war. At the commencement he was in the habit of resting on the expectative, and intervening only when phenomena of infection manifested themselves. The results were deplorable. During the second phase, having come to the conclusion that all war wounds should be treated as infected, he used to operate immediately, making free openings. The results were better, but suppuration invariably appeared in a few days or weeks with a considerable loss of tissue from sloughing. In the third phase, in order to avoid the sloughing and suppuration, he resected all the necrosed parts and explored systematically the wound for projectiles. He used as his guide in this search the blackening of the track of the bullet. This new procedure was again marked by improvement, but the wound tended to remain grayish in color and wanting in tone. Usually there was a good deal of discharge for at least a week. In the fourth phase he acted on the supposition that in the course of his systematic exploration of the wound he was inoculating one part from another by means of his instruments. Therefore, in the fourth stage he practiced complete drying of the wound, followed by treatment with tincture of iodin in order to destroy the micro-organisms which he had involuntarily sown on the surface. The results were now very much better; there was no suppuration or fever, and the wound granulated rapidly and was of a healthy appearance. He tried Carrel's method, but obtained results distinctly inferior to those he was already having. Since July, 1915, he has returned to the method of his fourth phase, supplemented by early tentative incomplete suture. The results have been so encouraging that he has increased the number of the sutures and applied the method to a larger proportion of his cases. This method is still in use and may easily be described as follows: (1) free exposure of the track of the projectiles; (2) removal of all foreign bodies and all necrosed or detached tissues; (3) drying of the wound and treatment of its surface by tincture of iodin; (4) bringing together of the edges by provisional

sutures with drainage from the most dependent part either by the wound or by a counteropening.

Dr. Rocher is of the opinion that in wounds of the soft parts, especially in those due to shell fragments, it is not enough to remove the foreign bodies from the track or from the tissues which surround it. Nor should one trust entirely even to the most meticulous cleaning up with the usual antiseptics. It is, above all, necessary to excise all necrosed tissues, notably muscular masses which appear flaccid, pale or purplish, for it is in these that usually lie the germs of putrid suppuration and gaseous gangrene. This sacrifice of muscular tissue will often have to be considerable, but should always be carried out with discretion. In particular, one should be on one's guard against a future vicious position of the limb. In these circumstances surprising results are obtained as to the rapidity of the granulation and cicatrization of the wounds, and subsequently it is found that the function of the limb is scarcely, if at all, affected. Flat dressings, free drainage, exposure of the wound during cicatrization and secondary suture give greater security, which compensates for the time which might have been gained by an attempted primitive suture. Indeed, the latter operation would seem somewhat impracticable in a busy surgical formation at the front.

Dr. Proust, also, who is a member of the Faculté de médecine de Paris and a hospital surgeon, has laid before the Société de chirurgie de Paris an interesting note based on eighteen months of work in ambulances at the front. He first takes up the question of projectiles themselves. In the earliest part of the war most of the wounds were bullet wounds with only slight infection of the track. After these came shrapnel and shell fragment wounds. Later the trench warfare produced bullet wounds inflicted at close range and showing explosive effects. Still later there occurred more serious anatomic destruction caused by the frequent use of torpedoes, of hand grenades and high explosives. With regard to the infection of wounds, Proust remarks that the gravity of the wounds in the early part of the war was more particularly due to the defects in the organization of the service. Later it was attributable to the nature of the projectiles, to the multiplicity of wounds in one patient and to winter conditions in the trenches. From May 5, 1915, to Feb. 5, 1916, ten months, the surgical automobile ambulance No. 1, which was under Proust's direction, cared for 1,800 wounded. All the wounds were serious, since these formations are especially intended for the treatment of grave injuries. Of the 1,800 wounded, 419 died, which gives a mortality of 23 per cent. This high mortality is explained by the fact that the wounds are always infected. The infection may come from the projectiles or from fragments of clothes. The latter, being impregnated with filthy mud, are particularly dangerous. The tissues are torn and contused. The muscles which are injured are particularly liable to gangrene, and this may, in part, be explained by the depreciations which have been produced in them by fatigue and exhaustion. To these conditions should be added vascular lesions which are very often venous, probably due to the explosive action of projectiles. These are the principal reasons for the gravity of the wounds, and it is from them that one may draw indications for treatment. We must transform an irregular bullet track into a clean operation wound with free exploration. Proust drew special attention to certain points. In view of the frequency of tears of the venous trunks, he recommends ligature of the vessel outside the primitive lesion above and below and the removal of the injured section. The same is true of arterial lesions. The most serious factor is the injury of bone. Free fragments must be removed, but others must be treated prudently. As to joint wounds, this is Proust's formula: Every articulation that has been penetrated by a projectile other than a bullet must be freely opened. Drainage must be assured even if for that it is necessary to perform a resection, such as that of the patella or of the astragalus. In nerve injuries, operative indications are exceptional. Immediate sutures have been twice practiced in Proust's ambulance. For dressings Proust has recently employed almost exclusively Dakin's solution, salt water and magnesium chlorid. For fresh superficial wounds or for such wounds as result from circular amputation, hypertonic solution, 14 per cent., is, in Proust's opinion, the ideal topical application. It opposes putrefaction of the wounds, but its use must not be too much prolonged and it must be replaced soon by solutions of magnesium chlorid, which seem to have a maximum stimulating effect on the regenerating of the tissues and give admirable wounds. In the presence of lacerated wounds, whose infection is refractory in spite of free opening, Proust had the best results from Carrel's method, that is to say, discontinuous irrigation with fresh Dakin's solution. If the infection is characterized by a reddish color of the tissues and bronzed infiltration, Proust substitutes ether for Dakin's solution. Thanks to this careful selection of topical applications, local accidents, such as diphtheria of the wounds, abundant suppuration, etc., have become a thing of the past. Unfortunately there exists a class of infections against which one is helpless. These are the massive primitive infections. Thus in some wounded soldiers one observes, a few hours after the injury, a high temperature, a pulse scarcely perceptible, and hippocratic facies, contrasting strongly with a sense of general well-being or even of excitement. Left to themselves such patients die in from twenty-four to thirty-six hours. The wounds have often a gangrenous smell; the freest opening is useless. Amputation alone can save life, and then only if it is rapidly performed so as to avoid shock. When obliged to amputate, Proust has always adopted the circular operation. He remarks that even if one passes well above the lesion and operates in parts which apparently are healthy, one must always cut through a vascular sheath or bone marrow already infected in some degree, and the slightest attempt to bring together the soft parts in such cases results in serious complications, and may even cause osteomyelitis of the stump.

COMPLETE DIVISION OF THE FEMORAL ARTERY AND VEIN WITHOUT HEMORRHAGE BY A FRAGMENT OF SHELL

Dr. Jumon reported to the Réunion médicale de la I-ère Armée the case of a soldier who had the femoral vein and artery cut at the point of Scarpa's triangle by a fragment of shell but who, for several days, had no hemorrhage, although no tourniquet or ligature had been applied. The retracted ends of the vessels were distant from one another 5 cm. (2 inches). Clots assured the hemostasis in spite of an intense suppuration of the wound. The suppuration was due to the presence of a fragment of shell in the muscles, and it was accompanied by septicemic phenomena and considerable phlebitic reaction of the femoral vein. The artery and vein were ligatured and the fragment of shell removed. The progress of the case was uninterrupted.

Marriages

GEORGE JOHN MARQUETTE, M.D., to Miss Mona Beaumont, both of Deer Lodge, Mont., at Rock Creek Lake, Mont., September 6.

UDO JULIUS WILE, M.D., Ann Arbor, Mich., to Miss Katherine Eleanor Work of Elkhart, Ind., at Colorado Springs, August 31.

LEON GRANT SMITH, M.D., Montevidio, Minn., to Miss Edith Jeannette Lumley of Ellsworth, Wis., August 30.

JOHN JOSEPH WHORISKEY, M.D., to Miss Katherine E. McDonald, both of Cambridge, Mass., September 4.

HARRY LEROY GOFF, M.D., Cheyenne, Wyo., to Miss Lola May Buckingham of Chicago, about September 11.

JAMES EDWIN WALSWORTH, M.D., to Miss Margaret Mai Hutchinson, both of Nashville, Tenn., August 24.

ELLIS BENJAMIN FREILICH, M.D., to Miss Mildred Kamermann, both of Chicago, about September 6.

JAMES BIRNEY GUTHRIE, M.D., to Haidee Weeks Lathen, D.D.S., both of New Orleans, September 5.

JOSEPH STONE LYON, M.D., Hartranft, Tenn., to Miss Ethel B. Lindsay of Allisonia, Va., September 2.

HARRY ALBERT GILTNER, M.D., Omaha, to Miss Henrietta Till Kuenster of Kansas City, August 28.

CHARLES ALBERT ROBB, M.D., Rock Island, Ill., to Miss Marie Metz of Chicago, September 11.

JOHN REUBEN GREEN, M.D., to Miss Laura Belle Kelley, both of Independence, Mo., August 16.

IRVING CLEVELAND MILLER, M.D., Berlin, Pa., to Miss Violet K. Clark of Meyersdale, Pa., July 12.

SIDNEY L. OLSHO, M.D., to Miss Katinka M. Dannenberg, both of Philadelphia, September 11.

EVAN ELLIS OWEN, M.D., to Miss Marie Katherine Reh, both of Louisville, Ky., September 6.

GILBERT J. WHITE, M.D., to Mrs. Ada Arends, both of Chicago, August 22.

Deaths

Edward Louis Duer, M.D., Odessa, Del.; University of Pennsylvania, Philadelphia, 1860; aged 80; a Fellow of the American Medical Association; surgeon of volunteers during the Civil War and later an obstetrician and gynecologist of Philadelphia; for many years obstetrician to the Philadelphia Hospital; consulting obstetrician to Preston Retreat and Maternity Hospital; gynecologist to the Presbyterian Hospital; consulting gynecologist to the Home for Incurables; one of the founders of, and gynecologist to the Policlinic Hospital; twice president of the Philadelphia Obstetrical Society; a fellow and once vice president of the American Gynecological Society; died at his home, September 5. Dr. Duer enjoyed a large practice, was loyal and devoted to his patients, thoughtful and considerate of his brother practitioners and a loyal and steadfast friend.

Bernard Charles Gudden, M.D., Oshkosh, Wis.; Rush Medical College, 1879; aged 59; a Fellow of the American Medical Association and one of the most prominent gynecologists of Wisconsin; local surgeon of the Chicago and Northwestern Railway and attending surgeon to St. Mary's Hospital, Oshkosh; in whose honor the Oshkosh Medical Club gave a dinner, April 14, 1911, on the occasion of the thirtieth anniversary of his entrance into the practice of medicine in Oshkosh; is reported to have committed suicide by strangulation, September 14, while of unsound mind by reason of a nervous breakdown.

Capt. Eugene Potter Stone, Medical Director, U. S. Navy (retired), North Sutton, N. H.; Harvard Medical School, 1884; aged 55; a Fellow of the American Medical Association; who entered the navy, Aug. 5, 1886; for a time in charge of the Naval Hospital at Manila, and who was retired, June 24, 1914, with the rank of next higher grade to that held on active list on account of incapacity resulting from an incident of service, after a sea service of eleven years and eleven months, and thirteen years and eight months of shore or other duty at North Sutton; died September 8.

John William Foss, M.D., Phoenix, Ariz.; Harvard Medical School, 1899; aged 54; a Fellow of the American Medical Association, and a member of the House of Delegates in 1905; a member of the Association of Military Surgeons of the United States; formerly secretary of the Arizona Medical Association and Arizona Academy of Medicine; a specialist on diseases of the nose, throat and chest; commissioned captain and assistant surgeon, Arizona National Guard, in 1904; died at his home, July 20, from chronic nephritis.

Joseph C. Carson, M.D., Valparaiso, Ind.; Medical College of Indiana, Indianapolis, 1880; Northwestern University Medical School, Chicago, 1888; aged 66; formerly a Fellow of the American Medical Association; a member of the Indiana State Medical Association; for twelve years coroner of Porter County and a lecturer in the medical department of Valparaiso University; died in Valparaiso, September 6, after an operation for appendicitis.

David Strock, M.D., Waukon, Iowa; University of Missouri, Columbia, 1875; aged 75; formerly a member of the Iowa State Medical Society and president of the Allamakee County Medical Society; a veteran of the Civil War; for thirty-five years a practitioner of Waukon; county physician of Allamakee County; health officer of Waukon, and state oil inspector for the district; died in Dyersville, Iowa, September 2, from arteriosclerosis.

James Edward Oldham, M.D., Wichita, Kan.; Medical College of Ohio, Cincinnati, 1877; aged 68; a Fellow of the American Medical Association, and once president of the Kansas Medical Society; president of the staff of the Wichita Hospital for several years; local surgeon to the Rock Island System and for a time consulting surgeon to the Missouri Pacific Railway; died at his home, September 3, from nephritis.

Thomas Emmett Stratton, M.D., Richmond, Va.; Medical College of Virginia, Richmond, 1863; aged 76; a member of the Medical Society of Virginia; from 1868 to 1870 president of the Board of Health of Richmond and for many years an officer of the United States Public Health Service; who served in the Medical Department of the Confederate Army throughout the Civil War; died at his home, September 6.

Llewellyn Arch Bishop, M.D., Fond du Lac, Wis.; Hahnemann Medical College, Chicago, 1870; aged 70; formerly a Fellow of the American Medical Association; a member of the State Medical Society of Wisconsin; local surgeon to the Chicago and Northwestern, and Minneapolis, St. Paul and Sault Ste. Marie systems; twice mayor of Fond due Lac; died at his home, September 2, from cerebral hemorrhage.

James Rutherford Cannon, M.D., Walker, Minn.; College of Physicians and Surgeons in the City of New York, 1903; aged 34; formerly a practitioner of Irvington-on-Hudson, N. Y., and visiting physician to the Tarrytown Hospital; for the last two years assistant superintendent of the Minnesota State Sanatorium for Tuberculosis, Walker, Minn.; died in that institution, September 5.

George Whiting Ross, M.D., Carollton, Ill.; College of Physicians and Surgeons in the City of New York, 1879; aged 59; a Fellow of the American Medical Association and formerly president of the Western Illinois Medical and Surgical Society and Greene County Medical Society, and trustee of the Central Illinois State Hospital for the Insane; died August 31, from nephritis.

William Ewing Hallock, M.D., Pittsburgh; University of Pennsylvania, Philadelphia, 1878; aged 67; a Fellow of the American Medical Association and one of the best known practitioners of Pittsburgh; for several years a member of the staff of the Children's Hospital and West Penn Hospital; died suddenly on a Pennsylvania train in the Pittsburgh station, December 4.

Andrew Woods Smyth, M.D., Londonderry, Ireland; Tulane University, New Orleans, 1859; aged 83; from 1862 to 1887 a member of the Louisiana State Board of Health; for many years house surgeon of the Charity Hospital, New Orleans, and later director of the United States Mint; who returned to his birthplace in Ireland in 1894; died near Londonderry, September 4.

Reuben Willis, M.D., Somerville, Mass.; Harvard Medical School, 1867; aged 73; a member of the Massachusetts Medical Society; a veteran of the Civil War; for forty-five years a practitioner of Somerville and a member of the staff of the Somerville Hospital; died in the Robert Bent Brigham Hospital, Boston, September 6, from cerebral hemorrhage.

Stephen Wendell Abbott, Lawrence, Mass. (license, Massachusetts, act of 1894); a practitioner since 1879; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society, and a member of the consulting staff of the Lawrence General Hospital; died in a private hospital in Lawrence, September 1.

George P. True, M.D., Kansas City, Mo.; Kansas City (Mo.) Medical College, 1882; aged 66; sanitary inspector of the Board of Health of Kansas City, and prior to that time assistant superintendent of the Kansas State Hospital, Ossawatomie, and later of State Hospital No. 3, Nevada, Mo.; died at his home, September 1.

Elbert Augustus Ainsworth, M.D., West Union, Iowa; Syracuse (N. Y.) University, 1874; aged 67; city health officer of West Union; local surgeon for the Chicago, Milwaukee and St. Paul Railway; physician of Fayette County and a member of the local board of education; died at his home, August 31.

Percival Goodwin Wardwell, M.D., Beverly, Mass.; Hahnemann Medical College, Philadelphia, 1869; aged 81; for more than forty years a practitioner of Beverly, and at one time city physician; died at the home of his daughter in Maplewood, N. J., September 8, from the result of injuries received in a fall.

Benjamin F. Taylor, M.D., Columbia, Ky.; University of Louisville, Ky., 1879; aged 68; a member of the Kentucky State Medical Association; who was injured when the automobile in which he was riding plunged off a bridge near Columbia, August 22, died from his injuries the next day.

William S. Pickard, M.D., Mikana, Wis.; Northwestern University Medical School, Chicago, 1886; aged 57; a Fellow of the American Medical Association; for many years a practitioner of Maywood, Ill.; died in Mikana, September 10.

Albert Leffingwell, M.D., Aurora, N. Y.; Long Island College Hospital, Brooklyn, 1874; aged 71; president of the American Humane Association in 1904-1905; died at his home, September 1.

Irwin Coleman Sutton, M.D., Los Angeles; St. Louis College of Physicians and Surgeons, 1895; aged 50; formerly of Bancroft, Neb., and Portland, Ore.; a Fellow of the American Medical Association; died in a hospital in Glendale, Calif., August 29, from arteriosclerosis.

George Carleton Parker, M.D., Winthrop, Me.; Dartmouth Medical School, Hanover, N. H., 1881; aged 65; a member of the Maine Medical Association and once president of the Somerset and Kennebec Medical societies; died at his home, September 7, from cerebral hemorrhage.

James G. Turk, M.D., Clinton, Mo.; University of Louisville, Ky., 1857; aged 83; assistant surgeon of the Third Kentucky Volunteer Infantry during the Civil War; for the last twenty-five years engaged in mercantile business in Clinton; died at his home, August 21.

Solomon Baruch, M.D., New York; New York Homeopathic Medical College, New York, 1876; aged 60; formerly captain and assistant surgeon of the Twelfth Infantry, N. G. S., N. Y.; died at his home, September 6, from arteriosclerosis.

James F. Pearce, M.D., Claussen, S. C.; Jefferson Medical College, 1857; aged 81; formerly a member of the South Carolina Medical Association; a Confederate surgeon; for many years a practitioner of Florence County; died at his home, August 29.

John Levant Ramsdell, M.D., Albion, Mich.; University of Michigan, Ann Arbor, 1881; aged 64; a Fellow of the American Medical Association; died at St. Mary's Hospital, Rochester, Minn., September 2, three days after a surgical operation.

William P. Stuckle, M.D., Conception, Mo.; Central Medical College, St. Joseph, Mo., 1896; aged 44; a Fellow of the American Medical Association; died in a hospital in St. Joseph, Mo., August 31, following an operation for appendicitis.

Henri Iskowitz, M.D., New York; College of Physicians and Surgeons in the City of New York, 1905; aged 31; a specialist on diseases of the ear, nose and throat; died September 8, three weeks after a surgical operation.

Baxter Smith, M.D., Bay City, Texas; Tulane University, New Orleans, 1874; aged 70; formerly a member of the State Medical Association of Texas; a Confederate veteran; died at his home, August 25, from malignant disease.

Arthur Marsden, M.D., Rio, Wis.; St. Louis College of Physicians and Surgeons, 1895; aged 47; a member of the State Medical Society of Wisconsin; was found dead in his office, September 1, from heart disease.

Aristide W. Giampietro, M.D., Tampa, Fla.; University of Maryland, Baltimore, 1907; aged 34; a member of the American Chemical Society; died in the Gordon Keller Hospital, Tampa, August 30, from pneumonia.

K. P. Thom, M.D., Gallion, La.; Memphis (Tenn.) Hospital Medical College, 1904; aged 45; was shot and almost instantly killed by Dr. B. McKoin of Mer Rouge, La., in an altercation at Gallion, August 25.

Samuel Moore Reynolds, M.D., New York; Berkshire Medical College, Pittsfield, Mass., 1866; aged 75; for thirty years a practitioner of New York; died in St. Luke's Hospital, September 7, from diabetes.

John H. Nicol, M.D., Kansas City, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 67; died in Clio, Iowa, July 1, after an operation for the removal of gallstones.

Edward A. Schmitz, M.D., Wauwatosa, Wis.; College of Physicians and Surgeons, Chicago, 1884; aged 55; health commissioner of Wauwatosa; died at his home, August 30.

Michael Lewinski, M.D., New York; Imperial University of Warsaw, Poland, 1885; aged 54; died at his home, September 1, from cerebral hemorrhage.

John S. Crow, M.D., Chicago; Rush Medical College, 1901; aged 53; died at his home, September 11, from carcinoma of the pancreas.

Martha A. Canfield, M.D., Cleveland; Homeopathic Hospital College, Cleveland, 1875; died at her home, about September 4.

George K. Herman, M.D., Chicago; Rush Medical College, 1891; aged 62; died, September 12, from heart disease.

Prudent Bedard, Norway, Me. (license, Maine, act of 1895); aged 63; died at his home, August 29.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

MARK WHITE GOITER SERUM AND MARK WHITE IODINIZED OIL

Report of the Council on Pharmacy and Chemistry

The "Mark White Goiter Serum Laboratories" of Chicago asked the Council to consider its products "Mark White Goiter Serum" and "Mark White Iodinized Oil." The "serum" was claimed to be an "antibody blood serum from a goat with thyroidosis" while the "Iodinized Oil" was said to contain "about 4 grains of iodin" to "each c.c." The therapeutic indications for the treatment were given as:

"Simple or Exophthalmic Goiter, Hyperthyroidism-dosis, Thyrosis, Thyroidosis, Thyrotoxicosis, Dementia."

An ampule (2 c.c.) of the "serum" is to be injected into the thyroid to be followed one week later by an ampule (2 c.c.) of the "Iodinized Oil." Repetition of this "treatment" once or twice a month is advised.

The Council asked for more specific information as to the composition of the remedies, particularly as to the preparation and nature of the serum; it also asked for evidence of the therapeutic value of the preparations. In reply, Mark White wrote:

"All that I can say regarding the serum is that it is made from the blood of goats with thyroid affection, and it has been found that the serum from these goats has antibodies which control, or has curative effect upon thyroid affections when injected into thyroid glands of either humans or animals. As to the iodinised oil, it is only an adjunct or side treatment which is not always used or indicated, and will only be furnished to the physician for use in case in his judgment his patient needs it. We shall also advise the use of quinin . . . when indicated. . . ."

The Council was referred for further information to a paper by Rachel Watkins, M.D., published in the *Illinois Medical Journal*. It is to be noted, incidentally, that the letterheads used by White in this correspondence bore in one corner the notation "Rachel Watkins, M.D., Practice Limited to Goiter and Other Disorders of the Thyroid Glands," and in the other, "Mark White, Goiter Research."

The information regarding the composition of this goiter treatment, as furnished in Dr. Watkins' paper, was to this effect:

"The medical treatment consists of the administration of a blood serum derived from a thyroidized goat. Formula: Iodine 0.16 grams [according to a correction by Mark White, this should read 0.26 gm.], oil 0.25 c.c., serum q. s. 1 c.c."

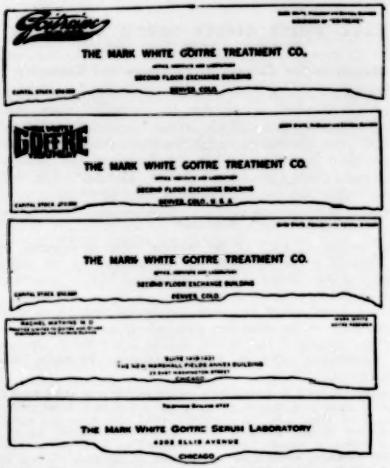
This description of the treatment differs from that furnished to the Council by Mark White in that here the iodin and oil appear to be combined with the serum. Dr. Watkins' "formula" implies that the iodin is a routine medication, thus contradicting White's statement, which, in turn, is at variance with the statements made in submitting the treatment.

The Council does not accept any biologic product until its sale in interstate commerce has been authorized by the secretary of the treasury in accordance with the federal law regulating the sale of viruses, serums, toxins and analogous products. The sale of the Mark White Goiter Serum has not been so authorized; consequently even if the preparation complied with other rules of the Council it could not be accepted.

In addition, however, this treatment conflicts with other Council rules. The statements regarding its composition are indefinite and contradictory (Rule 1); the evidence presented to support the therapeutic claims is insufficient in itself and does not appear to have been checked by any disinterested authority (Rule 6). Moreover, the recognized variation in the morphology and pathology of the types of goiter render it impracticable to treat cases of goiter by any routine procedure.

The foregoing report was submitted to the Mark White Goiter Serum Laboratory. In reply, a letter signed "Mark White, V.M.D.," was received, which read, in part:

". . . we hope at some future time to be able to give you more detailed information, but as you possibly appreciate that we have experienced for some time a demand on the part of many physicians that we furnish to them our therapy, which necessitates us furnishing it before all the detail work has yet been accomplished, and I trust


THE MARK WHITE GOITRE TREATMENT CO.
SECOND FLOOR EXCHANGE BUILDING
DENVER, COLO.
THE MARK WHITE GOITRE TREATMENT CO.
SECOND FLOOR EXCHANGE BUILDING
DENVER, COLO. U. S. A.
THE MARK WHITE GOITRE TREATMENT CO.
SECOND FLOOR EXCHANGE BUILDING
DENVER, COLO.
THE MARK WHITE GOITRE SERUM LABORATORY
6300 ELLIS AVENUE
CHICAGO

Photographic reproductions (greatly reduced) of some of the letterheads used by the Mark White concern during the past five years.

that you will be so kind as to bear patiently with us until we are better in a position to make a complete scientific application and report to you."

White wrote further:

"The serum and iodized oil may be mixed for immediate use, but could not be put up only separate for the use of the profession and the therapy furnished Dr. Watkins she mixed as used."

This statement throws no light on the discrepancies in the statements with regard to the place of the iodinized oil in the treatment, namely: (*a*) the original statement that the oil was to be given a week after the serum; (*b*) White's statement (quoted earlier in this report) that the oil "is only an adjunct or side treatment" and "is not always used or indicated"; (*c*) the statement in Dr. Watkins' paper that the oil and the serum are given in combination.

The Council declared the Mark White Goiter Serum and Mark White Iodinized Oil ineligible for New and Nonofficial Remedies and authorized publication of this report.

Editorial Note on the Mark White "Serum"

As some of our readers will remember, on April 26, 1913, THE JOURNAL called attention to the Mark White preparation which at that time was being exploited from Denver. The Propaganda Department has in its files a number of letters sent out from the Mark White concern at various times. One mailed in May, 1911, on the embossed stationery of "The Mark White Goiter Institute," Exchange Building, Denver, was evidently a general letter sent to physicians, calling their attention to "the most important medical discovery of the age." "Dr. Mark White, a graduate of the University of Pennsylvania," said the letter, had discovered "a simple and harmless remedy" that would cure goiter. "Because of the desire to preserve the secrecy of this remedy it is given only at the office here." It was then suggested that the doctor might send those of his patients who were suffering from thyroidism to the "Mark White Goitre Institute." If he would do so he would be "given a commission of $10, in cases of the $50 fee with the additional $5 for each $50 increase." It closed with some casuistic arguments, presumably for the purpose of overcoming the physician's scruples, summing up the matter with the statement:

"No right thinking man will allow a narrow and self-seeking system of ethics to stand between him and his duty to the sick and suffering."

About 1912 the name of the concern seems to have been changed, for we have in our files a letter addressed to a layman on the stationery of the "Mark White Goitre Treatment Company." According to this letterhead the product this concern had for sale was "Goitreine" discovered by Mark White, "President and General Manager." Mr. White's letter to the sufferer from goiter assured him that if he would take "Goitreine" he might "be practically sure of an immediate and permanent cure." "Goitreine," according to White, "has absolutely and permanently cured 90 per cent." of all cases of goiter in which it has been used—"and the other ten showed remarkable improvement." It was efficacious for all forms of goiter and "cannot possibly harm."

The person who received this assurance might have had his confidence in it shaken had he seen a copy of the Denver *News* for May 23, 1911, in which was reported a case of collapse and death in a woman following an injection given in White's office. The paper stated that the death certificate was signed by one W. A. Gray and gave "fatty degeneration of the heart and goiter" as the cause of death. Gray, it seems, was the licensed physician employed by Mark White to administer "Goitreine"—if that is what White happened to be calling his product at that time. For here it may be stated, parenthetically, that Mark White is not a physician; he is a veterinarian.

In February, 1913, Mark White sent a circular letter to a number of medical publications with the request that it be printed in full in the next issue, "to cover one full page of space." The letter White wanted printed was addressed to doctors offering to "enter into a copartnership agreement" with such physicians who would be willing to treat "patients with goiter affections on a 50 per cent. commission basis."

"You would be expected to make a cash charge to the patient for the treatment, remitting on the same day our 50 per cent. to us, when ordering the treatment, giving the treatment in no cases for less than $50.00."

About the same time that Mark White made this "fifty-fifty" offer, he sent in an advertisement to be published in the classified column of THE JOURNAL. At that time he was

DAYS A WEEK—SUNDAY MORNING, SEPT
DR. MARK WHITE'S
NEW GOITRE TREATMENT
is acknowledged today by those who first doubted its permanency, to be one of the greatest medical discoveries of the age. The results obtained not only are permanent, but delightful. The treatment is given by a licensed physician. Write or call for particulars. Office 203 Exchange Bldg., Denver.

When exploited from Denver the Mark White "goiter cure" was advertised in the daily papers. Here is a photographic reproduction (reduced) of an advertisement that appeared in the Denver *Post*, Sept. 1, 1912.

told his advertisement was not acceptable; we now reprint it, however, free of charge. Here it is:

"WANTED—ONE OR MORE PHYSICIANS in each vicinity to administer and represent our new medical treatment for GOITER. Good margin of profit. Write for copy of contract. The Mark White Goitre Treatment Co., Denver, Colo."

In 1914, White moved to Chicago. At least the card which we reproduce so indicates. At that time, as will be seen, "Dr. Mark White" was "personally associated" with Peter S. Clark, M.D. According to the same card Dr. F. D. Paul of Rock Island, Ill., seems to have been his "associate" for that particular locality. In this connection, it is worth noting that a Rock Island paper, in one of its issues during July, 1913, devoted a good deal of space to "Dr. Mark White" who

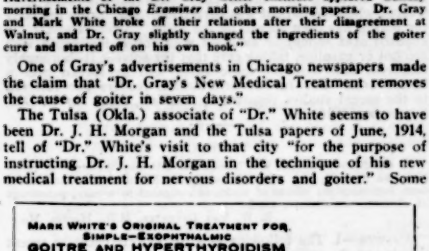
was at that time in Rock Island "directing Dr. Frank D. Paul in the administering of the treatment." There was nothing to indicate that this notice was an advertisement or that the editorial appearing in the same issue puffing White's "important cure," was paid for.

Dr. W. A. Gray, who has already been mentioned as White's associate in Denver, seems to have been doing business in Illinois some time in 1913 and a Princeton (Ill.) paper had some uncomplimentary things to say about him. Finally in July, 1913, this item appeared in a Princeton paper.

"Dr. W. A. Gray, the goiter specialist who operated last winter at Princeton and Walnut until he became embroiled with Dr. Mark White, a Denver veterinary and originator of the cure, over a division of the spoils, has opened a goiter institute in Chicago under his own name. Advertisements of the Dr. Gray Goiter Institute appeared Sunday morning in the Chicago *Examiner* and other morning papers. Dr. Gray and Mark White broke off their relations after their disagreement at Walnut, and Dr. Gray slightly changed the ingredients of the goiter cure and started off on his own hook."

One of Gray's advertisements in Chicago newspapers made the claim that "Dr. Gray's New Medical Treatment removes the cause of goiter in seven days."

The Tulsa (Okla.) associate of "Dr." White seems to have been Dr. J. H. Morgan and the Tulsa papers of June, 1914, tell of "Dr." White's visit to that city "for the purpose of instructing Dr. J. H. Morgan in the technique of his new medical treatment for nervous disorders and goiter." Some


MARK WHITE'S ORIGINAL TREATMENT FOR SIMPLE—EXOPHTHALMIC GOITRE AND HYPERTHYROIDISM

DR. MARK WHITE

HOME OFFICE AND PERSONALLY ASSOCIATED WITH PETER S. CLARK, M. D., 925 MONROE BUILDING 104 SOUTH MICHIGAN AVENUE MONROE AND MICHIGAN HOURS BY APPOINTMENT 9 TO 4 P. M. PHONE RANDOLPH 1138 CHICAGO, ILL.

ASSOCIATED, BY APPOINTMENT ONLY, WITH F. D. PAUL, M. D., ROCK ISLAND, ILL. W. S. LEE, M. D., NASHVILLE, TENN. G. O. RICE, M. D., DENVER COLO J. H. MORGAN, M. D., TULSA, OKLA. AND OTHERS

Photographic reproduction (reduced) of the "professional" card used by "Dr. Mark White" after he came to Chicago.

months later—in December, 1915—the following little item appeared in a Tulsa paper:

"Dr. Mark White was found guilty in the county court yesterday of practicing medicine without a license and was fined $50. Doctor White is a goiter specialist."

In September, 1915, Mr. Thomas S. Hogan, the efficient counsel for the Illinois State Board of Health, instituted action against Mark White for practicing medicine without a license. The case was tried Oct. 15, 1915, and the jury, after being out four hours, returned a verdict of "not guilty." Attorney Hogan attributes the failure to obtain a conviction to the testimony of Dr. Rachel Watkins who said she had a partnership arrangement with White in carrying on the medical business. It was about this time that Mark White seems to have issued some new letterheads. These bore in their upper left hand corner the device "Rachel Watkins, M.D., Practice limited to Goiter and Other Disorders of the Thyroid Glands," while the upper right hand corner read "Mark White, Goiter Research."

On Dec. 9, 1915, Rachel Watkins, M.D., of Chicago read a paper entitled "A Serum Treatment for Physiologically Defective Thyroids, With Clinical Reports" before the Stock Yards Branch of the Chicago Medical Society. The "serum treatment" discussed was Mark White's "Goitreine" which, in the course of its checkered career, had lost its original name by the wayside. This paper appeared in the December, 1915, issue of the *Illinois Medical Journal*.

Probably emboldened by the ease with which a component part of the American Medical Association "fell for" a paper exploiting a "goiter cure," Dr. Watkins requested that she be permitted to read a paper on the same subject before the Section on Pharmacology and Therapeutics at the Detroit meeting of the American Medical Association last June. The request was refused. Dr. Watkins is apparently no longer connected with White and in fact has protested against the use of her name by White in connection with his "goiter cure."

[After the above was in type and ready for the pages of THE JOURNAL, attention was called to the *Official Bulletin of the Chicago Medical Society* of Sept. 16, 1916. This *Bulletin* contained a full page advertisement of the Mark White "goiter cure." The advertiser referred to the preparation as having been "announced to the Chicago Medical Society" and declared it to be "an ethical therapeutic agent." Mark White was described as "a medical research student" but no hint was given that he is a veterinarian. After again emphasizing that "this therapy is ethically proven" physicians were invited to "visit our goats when convenient" and the advertisement closed with the modest claim that "this thyroid therapy has equal curative therapeutic value in these cases as quinin in malaria." And this sort of pseudo-scientific claptrap is presented to a presumably learned profession through its own official *Bulletin*—but what's the use of commenting!]

Correspondence

Malignant Pustule: A Missionary's Observation

To the Editor:—I have often thought of offering the following incident for publication, but not being a medical man, I hesitated to do so.

China missionaries often come in contact with a fatal form of anthrax. It comes sporadically as a malignant pustule on or about the lip, and requires usually less than a week to cause death. Heretofore our American physicians in China have said there was nothing to do for it but cut it all out in the initial stages. As it is difficult to get this accomplished, few, if any, are saved. In a case in which I saw the patient die with it, after the third or fourth day, not only the face and head but also the whole body was swollen, and death occurred shortly afterward.

In 1915 there occurred in the city and district of Haichow, China, an epidemic of rinderpest. The medical missionary, Dr. L. S. Morgan, was called in by the officials to fight it. He discovered from some source that when the rinderpest attacked people, it could be treated with powdered ipecac as a poultice. He tried and found it eminently successful. On hearing him relate his experience, I asked if he thought the ipecac would cure this other form of anthrax. He thought so. I therefore made a practice of carrying the ipecac in my first aid package. Some weeks afterward, being in a distant town, a man came to me with this fatal anthrax, appealing for help. I poulticed him two days successively. The pustule immediately stopped growing, and became soft. On leaving I gave him an extra dose of the ipecac in case of need. The man himself was entirely cured, and, as I afterward learned, the extra dose cured another man. So far as I know this is the first time that fatal anthrax has been treated with ipecac, and it is the only cure I have ever heard of.

(REV.) HUGH W. WHITE, Bedford, Va.
(Yencheng: Kiangsu, China).

Magnesium Sulphate in Burns

To the Editor:—In his article on the use of magnesium sulphate (abstracted in THE JOURNAL, Aug. 5, 1916, p. 466), Dr. Meltzer mentions the good results which he has obtained by the use of magnesium sulphate in burns. While government physician in the Pribiloff Islands in the Bering Sea, I had many cases of burns and scalds among the natives. In one case a native had severely scalded both feet by knocking over a bucket of boiling water. The man had to walk 11 miles to the hospital. He had removed his socks and had on a pair of rubber boots. On arrival at the hospital his feet

were in a sad condition. The right foot was by far the worst, and resulted in the sloughing of the tissues up to the ankle. The foot was dressed three times daily with wet dressing of saturated solution of magnesium sulphate, and between the dressing periods the foot was soaked in this solution. At the end of eighteen days the man was able to return to his work. Also I used magnesium sulphate dressings entirely in the cases of erysipelas, of which there were a great many.

H. Esmond, F.R.C.S., Union League Club, San Francisco.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

OZONE IN BRONCHITIS

To the Editor:—Can you give me any information with reference to the value of the violet ray high frequency generator with special ozone generator attachment for the treatment of bronchitis? The apparatus is an electrical instrument and is handled in this part of the country by the Charles A. Branstoy Company of Toronto. They also sell a book with the machine, written by Noble M. Eberhart, M.D., Ph.D., D.C.L., professor and head of the department of physiologic therapeutics, medical department, Loyola University, Chicago, professor of high frequency, Illinois School of Electro Therapeutics, author of "Practical X-Ray Therapy," "Vibratory Technique," etc. The apparatus may be all that they claim it to be and I only hope that such is the case. I feel, though, as if I would like to receive some reliable "outside" information regarding same before expending from $30 to $40 on it.

D. C. Wigg, M.D., Oshawa, Ont.

Answer.—Some years ago the treatment of bronchitis by ozone was thoroughly tried by many physicians and was discarded as being of no value whatever. In fact, ozone may cause more harm than good. It makes very little difference whether ozone is generated by the violet ray high frequency generator, by chemical means, or by a static machine.

TOXIC SUBSTANCE OF POISON IVY

To the Editor:—In your answer to Dr. Leland's communication regarding poison ivy (The Journal, Sept. 2, 1916, p. 763), you say that the toxic substance is an emulsion which is thick and sticky and which readily adheres to the hands and clothing. Would you object to making this interesting information more clear by stating explicitly what this emulsion is, etc.? Is it sap or a special production of the plant? Is it found in every part or only in some part or parts of the plant? Can it be dried and disseminated by the wind? You say that it is not volatile and yet people seem to contract ivy poisoning who have not been closer to a plant than a number of feet. I have always thought that the poison must pass through the air and be inhaled by persons found afterward to be poisoned. Are the extremely severe cases in which the entire body is covered by the dermatitis due entirely to actual contact with this emulsion by the hands or clothes? These points are extremely important in country practice.

Richard Cole Newton, M.D., Montclair, N. J.

Answer.—The emulsion is the sap of the plant and is found in most of the living parts. The heart wood, trichomes, pollen and ripe fruits do not contain it. It may be collected by making an angular incision into the bark and scraping out the exuded juice with the handle of a teaspoon. As exuded the juice is a viscid, cream-colored emulsion of the consistency of thick cream. On exposure to the air it darkens, becoming brown and eventually black. The sap is composed approximately of resin 80 per cent., gum 5 per cent. and water 15 per cent. The resinous portion is a nonvolatile, amber colored, sticky fluid which is a mixture of two liquid resins only one of which is toxic. The toxic portion is extremely poisonous, 1 : 1,000 mg. being sufficient to produce symptoms when rubbed on sensitive areas of the skin. The gum is similar to gum acacia and is not poisonous. It contains a powerful enzyme called laccase which, in the presence of air, causes the resin to take up oxygen, resulting in the production of a beautiful, lustrous, durable black varnish. In the Orient the sap of the eastern poison sumac, *Rhus vernicifera*, has been collected for varnishing purposes for more than 2,000 years under the name of Japanese lacquer and in Japan the art of employing the varnish has been brought to a very high state of perfection. The juice cannot be dried to a powder so that it may be disseminated by the wind. When dried it forms the nigrescent, adhesive varnish mentioned above. The popular belief that the poison may be carried through the air is, with rare exceptions, erroneous. Persons can be poisoned either by touching the toxic plants or by touching articles (such as tools or clothing) that have been in contact with the plants. The exceptions are the instances in which poisoning has resulted from exposure to the smoke from burning stems. It has been shown experimentally that this is physically possible by the carriage of the poisonous resin on particles of soot in the smoke. Other than this there are no authentic cases of poisoning without contact either with the plant or with contaminated objects. The nonvolatile nature of the poison, its extreme toxicity, its insolubility in water, and its absence in the cork cells, hairs and pollen have each been demonstrated by elaborate chemical and physical tests. The extremely severe cases of dermatitis covering the entire body have usually been contracted when the patient was perspiring. On drying the body the poison has been spread by the towel. After exposure the exposed area should be swabbed with cotton moistened with alcohol or gasoline, taking care that the solvent is thoroughly removed, otherwise the toxic agent will be spread over a larger area. For further information readers are referred to the recent studies reported by McNair, *Jour. Infect. Dis.*, September, 1916.

VODKA

To the Editor:—1. Can you furnish me with any literature or references on the sale, etc., of vodka as regards Russia? 2. What are the facts regarding the effects of vodka as compared to whisky, percentage of alcohol, manufacture, etc.?

R. W. Van Deventer, M.D., Hardin, Mo.

Answer.—1. The following is a list of references to recent articles on the subject:

Simpson, J. T.: Vodka Prohibition and Russian Peasant Life, *Contemporary Review*, December, 1915, cviii, 729.
Some Russian Doctors on Prohibition, *Survey*, Feb. 12, 1916.
Russia's Initial Victory, *Living Age*, Feb. 5, 1916, p. 367.
Beckterew, V. M.: Abolition of Drunkenness Among Russians: the Moral and Physical Uplift, *Russk. Vrach*, 1915, No. 15, abst., The Journal, Sept. 18, 1915, p. 1067.
Skerwell, A. J.: Russian Vodka Monopoly, *Contemporary Review*, May, 1915, cvii, 572.
Fight Against Vodka, *Independent*, April 6, 1914, p. 16.
Russia's Vodkaless Army, *Literary Digest*, Nov. 14, 1914, p. 965.
Iordanski, V. I.: Burn of Stomach by Strong Vodka, *Izvest. Obsh. Astrakhan Vrach*, 1911, iv, 5.

2. Vodka, or vodki, is a fiery tasting liquor, properly distilled from fermented rye mash but sometimes from barley corn, or potatoes. Before the Russian prohibition act of 1914, vodka was the principal alcoholic liquor consumed in Russia. As it was a government monopoly, the Russian government made every effort to insure a product of high purity, that is, as free from furfurol, amylic alcohol, etc., as was commercially possible. In consequence, vodka essentially was an aqueous solution of pure alcohol without color or added flavor. As prepared, vodka contains about 96 per cent. of absolute alcohol, but before being sold at retail it is diluted to contain from 40 to 60 per cent. Its physiologic effects are those of alcohol.

DYEING THE HAIR

To the Editor:—I should like to ascertain a suitable hair dye for changing a spot of white hair dark brown or black. I have a patient who has spots of white skin and one of these spots is on the head. The hair at this place is devoid of pigment. The papers and books on skin diseases recommend walnut stain. My recollection is that following the use of walnut stain there may be marked dermatitis.

K. W. Smith, M.D., Madison, Wis.

Answer.—The dyeing of the hair satisfactorily is a difficult matter except for those experienced in such measures. Nearly all barbers undertake such work; most of them use a paraphenylene diamin solution and iron sulphate to secure a brown color. There is some risk from dermatitis following the use of this solution but, with due caution, it is not great.

TREATMENT OF ALOPECIA AREATA

To the Editor:—Please suggest the latest treatment for alopecia areata. I have been treating a case for more than three years, and still the condition persists.

Colbert S. Davis, M.D., Rock Island, Ill.

Answer.—The treatment of alopecia areata is, of course, described in all textbooks on diseases of the skin. The latest treatment advised is vigorous exposure to ultraviolet light from a quartz lamp. Like all other treatments, it is uncertain of results; in fact, there is no method of treating alopecia areata that is sure to make the hair grow.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

CALIFORNIA: Los Angeles, Oct. 3. Sec., Dr. Charles B. Pinkham, Room 527 Forum Bldg., Sacramento.
COLORADO: Denver, Oct. 3. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.
GEORGIA: Atlanta, Oct. 10-12. Sec., Dr. C. T. Nolan, Marietta.
IDAHO: Wallace, Oct. 3. Sec., Dr. Charles A. Dettman, Burke.
ILLINOIS: Chicago, Oct. 10-12. Sec., Dr. C. St. Clair Drake, Springfield.
IOWA: Des Moines, Oct. 17-19. Sec., Dr. Guilford H. Sumner, State House, Des Moines.
KANSAS: Topeka, Oct. 10-12. Sec., Dr. H. A. Dykes, Lebanon.
MICHIGAN: Lansing, Oct. 10-12. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.
MINNESOTA: Minneapolis, Oct. 3-6. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.
MISSISSIPPI: Jackson, Oct. 24-25. Sec., Dr. J. D. Gilleylen, Jackson.
MONTANA: Helena, Oct. 3. Sec., Dr. William C. Riddell, Helena.
PORTO RICO: San Juan, Oct. 3. Sec., Dr. Quevedo Baez, San Juan.

Medical Council of Canada, 1915 Report

The Fourth Annual Report of the Medical Council of Canada reports that 88 candidates were examined during 1915, of whom 49, or 55.7 per cent. passed, 23 failed and 16 were refused in one or two subjects. The results for graduates of the Canadian Medical Schools represented at the examinations are shown as follows:

Medical School	Total Examined	Passed	Failed	Refused	Percentage Passed
McGill University	25	20	4	1	80.0
Queen's University	31	11	13	7	35.5
University of Toronto	11	7	2	2	63.6
Western University ...	9	5	2	2	55.6
University of Manitoba	8	5	..	3	62.6
Laval University	4	1	2	1	25.0
Totals	88	49	23	16	55.7

The highest percentage of graduates who passed was obtained by McGill with 80 per cent. The two universities having the lowest percentage of successes were Laval University with 25 and Queen's University with 35.5.

Georgia June Report

Dr. C. T. Nolan, secretary of the State Board of Medical Examiners of Georgia, reports the written examination held at Atlanta, June 1-2, 1916. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 80. The total number of candidates examined was 129, of whom 126 passed and 3 failed. Eleven candidates were licensed through reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Birmingham Medical College	(1915)	82.7
Medical College of Alabama	(1890)	82.4
Atlanta Medical College	(1915) 88.4; (1916) 80, 81.1, 82.9, 82.9, 83, 83, 83.2, 83.3, 84, 84.1, 84.2, 84.3, 84.4, 84.5, 84.7, 84.7, 84.9, 85, 85.1, 85.2, 85.2, 85.4, 86.1, 86.2, 86.2, 86.3, 86.4, 86.4, 86.5, 86.5, 86.6, 86.7, 86.8, 86.9, 86.9, 86.9, 86.9, 86.9, 87, 87, 87.1, 87.1, 87.3, 87.4, 87.5, 87.6, 87.7, 87.8, 88.1, 88.2, 88.2, 88.3, 88.3, 88.4, 88.4, 88.5, 88.6, 88.7, 88.8, 89, 89, 89.1, 89.2, 89.2, 89.3, 89.5, 89.6, 89.7, 89.7, 89.9, 90.2, 90.3, 90.4, 90.4, 90.5, 90.5, 90.6, 90.7, 91.3, 91.4, 91.4, 91.4, 91.5, 91.6, 91.6, 91.9, 91.9, 92.1, 92.5, 92.5, 92.7, 92.9, 93.3, 94, 94.8	
Atlanta School of Medicine	(1909)	81
University of Georgia	(1916) 80, 86.7, 86.9, 87.5, 87.7 88.4, 89.2, 90.3, 91.4, 91.5, 91.5	
Bennett Medical College	(1915)	80
University of Louisville	(1911)	80
Johns Hopkins University	(1912)	89.2
University of Maryland	(1915)	90.6
Columbia University, College of Phys. and Surgs.	(1916)	94.8
New York Homeo. Med. Coll. and Flower Hosp.	(1914)	86.6
Meharry Medical Coll.	(1912) 84.4; (1915) 82.2; (1916) 80.3, 83, 83.1	
University of West Tennessee	(1914)	84.7
Vanderbilt University	(1914) 81.9, 89.6; (1915) 81.6, 90	
FAILED		
Atlanta College of Physicians and Surgeons	(1907)	68.1
Meharry Medical College	(1916)	70
Knoxville Medical College	(1908)	73.6

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
University of Maryland	(1914, 2)	Maryland
American Medical College, St. Louis	(1911)	Missouri
University Medical College, Kansas City	(1904)	Missouri
Columbia University, College of Phys. and Surgs.	(1915)	N. Carolina
Leonard Medical School	(1907) Pennsylvania; (1910)	N. Carolina
Meharry Medical College	(1912)	Tennessee
University of Tennessee	(1904)	Tennessee
Vanderbilt University	(1914)	Tennessee
University of Virginia	(1903)	Tennessee

Book Notices

DISEASES OF THE SKIN. By Richard L. Sutton, M.D., Professor of Diseases of the Skin, University of Kansas School of Medicine. Cloth. Price, $6.50. Pp. 916, with 701 illustrations. St. Louis: C. V. Mosby Company, 1916.

Dr. Sutton is one of the most indefatigable of American dermatologists; a treatise on dermatology naturally comes as a sequence of his labors. He has been an independent investigator, but his work has been constructive and not iconoclastic. As would be expected, therefore, his treatise, while showing his independence of view, is along conservative lines, and is free from the unpardonable sin in a textbook of being controversial. The arrangement is an adaptation from the old classification of Hebra, which is still the most logical one for grouping cutaneous diseases. He gives an admirable preliminary consideration of the principle of dermatology, devoting nearly a hundred pages to this. This work is well done, and it is highly recommended for study to the practitioner who would obtain a grasp of the subject of dermatology as a whole, as distinguished from a smattering knowledge of a few dermatoses.

The remaining pages of the book are devoted to a consideration of the various dermatoses. In this, practically all diseases of the skin are more or less fully described. The commoner diseases are described in detail, the rarer ones briefly, but as fully as could be expected in a work of this size. The descriptions for the most part are concise but clear, and are written from a first hand knowledge of the subject. The Author has illuminated many of his topics by his own comments, but he has curbed any inclination to elaborate individual views which may not have general acceptance. Occasionally one wishes that he would loosen this curb a little, and allow more rein to his convictions. For example: If he were asked in conversation to say what eczema is, he would probably say that it is dermatitis; but when he comes to define eczema he gives the habitual old definition of an inflammatory disease of the skin, and writes out every lesion that can be produced by inflammation of the skin as characterizing it. He winds up, with the desperation of all authors who try to square this definition with their conscience, by exclaiming, "The fact remains that eczema is only a sort of dermatological scrap-heap." He then proceeds to give an excellent systematic description of the various forms of this scrap-heap. Which reminds one a good deal of the old woman who began her "patent medicine" testimonial by saying, "No words can describe the symptoms from which I suffered," and then proceeded to give a very full and complete description of them.

The illustrations are numerous and instructive. Most of the original pictures are good, and the reproductions have been well made. The book represents the best modern views of dermatology, and is a credit to the author and to American dermatology.

THE EXPECTANT MOTHER. By Samuel Wyllis Bandler, M.D., Professor of Gynecology in the New York Post-Graduate Medical School and Hospital. Cloth. Price, $1.25 net. Pp. 213, with 14 illustrations. Philadelphia: W. B. Saunders Company, 1916.

The author of the well known "Medical Gynecology" has prepared this book for physicians, nurses and the intelligent laity with the hope of explaining, in simple language, the physiologic process which the pregnant woman undergoes. Several of the chapters dealing with puberty and adolescence have been abstracted from the above mentioned book. The present book is more technical than most similar works on the subject; it is questionable whether anything is gained by informing the expectant mother, in a technical discussion, of the mechanism of fecundation and impregnation, or of the steps in the growth of the placenta. The author recommends in every case, after four and one half months, the use of an

abdominal belt, stating that a certain widely advertised brand is the best.

In speaking of the care of the intestinal tract during the last four weeks of pregnancy, the author says, in a somewhat involved sentence:

"Even if they (the bowels) move every day, it is advisable, once a week, to give the patient either—(a certain artificial proprietary mineral water) or aperient water or magnesia or some aperient which cleanses the intestines."

In the list of supplies with which each patient who is to undergo labor at home is to furnish herself, he includes one package of each of several proprietary preparations rejected by the Council on Pharmacy and Chemistry. One he says is ideal. If the patient takes as much of another as the author mentions in succeeding chapters, one bottle will hardly be sufficient.

In his discussion of the treatment of hemorrhoids he recommends another rejected preparation. The last few chapters of the book are devoted to complicated labors, eugenics, puberty, etc.

If Dr. Bandler would have been as conservative in his recommendations of proprietary medicines and preparations as he was in most of his advice on the subject of obstetrics, the book would be more in accord with modern medical ideals.

INFLUENCE OF OCCUPATION ON HEALTH DURING ADOLESCENCE. Report of a Physical Examination of 679 Male Minors under 18 in the Cotton Industries of Massachusetts. By M. Victor Safford, Assistant Surgeon, United States Public Health Service. Paper. Price, 10 cents. Pp. 51. Public Health Bulletin No. 78. Washington: Government Printing Office, 1916.

Under this somewhat too general title is published a report of the results of the physical examination of 679 male workers under 18 years of age employed in the cotton industries of Massachusetts. This investigation was made in a state which has been a pioneer in matters of industrial legislation, and in which not only public bodies, but also private employers have shown a high sense of their duty in such matters. It is not surprising, therefore, to find that the result of the inquiry is negative; that is to say, that it did not disclose any instances in which the minors were employed in work which inherently, or in the special conditions presented, was liable to be injurious to their health. Nevertheless, the author of the report, Surgeon Safford, thinks it advisable to make recommendations providing against such a contingency, the most important being the improvement in the present method of issuing employment certificates to minors. He proposes that this work shall be vested exclusively in some central state agency, and that the certificate, when issued, shall not be irrevocable, its renewal being conditioned on a favorable report as to the physical condition of the minor at work.

MILK AND ITS HYGIENIC RELATIONS. By Janet E. Lane-Clayton, M.D., D.Sc., Assistant Medical Inspector under the Local Government Board. Cloth. Price, $2.50 net. Pp. 348, with illustrations. Published under the Direction of the Medical Research Committee (National Health Insurance). New York: Longmans, Green & Co., 1916.

This book is published under the direction of the Medical Research Committee (National Health Insurance) in England. It represents a collection of the available scientific evidence on the hygienic relations of milk. Chapters are devoted to the general composition of human cow's milk; the organic and inorganic constituents; the biologic properties; the cellular content; breast feeding, and the relative values of boiled milk as compared with raw milk, especially in relation to the production of such diseases as scurvy and rickets. The later chapters of the book deal with the sources of contamination, the hygiene of production, and the methods of pasteurization. Each chapter is preceded by a short summary of its contents written in nontechnical language which enables the layman to obtain an insight into the subject. Each chapter is followed by a list of references to periodical literature on the subject discussed. The book will make a valuable reference work for those interested in pure milk production.

Medicolegal

Commission in Medical Reserve Corps Not Authority to Practice in State

(Haberlin vs. Englehardt (N.Y.), 157 N. Y. Supp. 839)

The Supreme Court of New York, Appellate Term, First Department, reverses a judgment obtained by the plaintiff for medical services rendered by him to the defendant. The court says that the only question litigated was whether the plaintiff, who was never registered to practice medicine in New York state, nor authorized to practice medicine under the public health law of the state, was entitled to practice medicine generally in the state by virtue of his commission as a first lieutenant in the medical reserve corps of the United States Army pursuant to the act of Congress of April 23, 1908. The question presented is a new one so far as the court has been advised or has been able to discover from an examination of the authorities, but it is not deemed a difficult one to determine when the statutes pertaining thereto are analyzed. The public health law of New York state provides that no person shall practice medicine unless licensed and registered as required, but "This article shall not be construed to affect commissioned medical officers serving in the United States Army, Navy, or Marine Hospital Service, while so commissioned." Section 7 of the act of Congress of April 23, 1908, provides that "for the purpose of securing a reserve corps of medical officers available for military service, the president of the United States is authorized to issue commissions as first lieutenants therein to such graduates of reputable schools of medicine, citizens of the United States, as shall from time to time, on examination to be prescribed by the secretary of war, be found physically, mentally and morally qualified to hold such commissions, the persons so commissioned to constitute and be known as the Medical Reserve Corps. The commissions so given shall confer on the holders all the authority, rights and privileges of commissioned officers of the like grade in the Medical Corps of the United States Army, except promotions, but only when called into active duty, as hereinbefore provided, and during the period of such active duty." What was the intent of Congress in the enactment of this statute? Is it not clearly apparent from a reading of the context thereof that the object was the creation by appointment of a body of medical doctors eligible for the Medical Corps of the United States Army in the event of emergency, but who in the meantime, unless promoted to the Medical Corps, are to be their own masters so far as their individual time and labor are concerned? If this is not so, then why was the language in the last sentence quoted used? Giving to this statute a liberal construction, the court is of the opinion that the plaintiff's duties as a medical officer do not begin, unless promoted to the Medical Corps, until called into active duty by the government, and that he is not serving in the United States Army until so called into active duty. If the court is correct in its views, then clearly the plaintiff failed to bring himself within the provisions of the saving clause of the public health law, which calls for a reversal of the judgment herein, rendered in the plaintiff's favor, and a dismissal of the complaint on the merits. Judgment reversed, with $30 costs, and complaint dismissed on the merits, with appropriate costs in the court below.

Malpractice Under Industrial Insurance Law

(Ross et ux. vs. Erickson Construction Co. et al. (Wash.), 155 Pac. R. 153)

The Supreme Court of Washington holds that, in this action by Ross and wife against the construction company and a physician to recover damages alleged to have been suffered by reason of the malpractice of the physician in the treatment at his hospital of plaintiff Ross for an injury sustained in the company's service, the plaintiffs had no cause of action. The court says that the physician was employed to do the surgical and hospital work for the construction

company, and was paid for his services out of a fund made up by deducting $1 from the monthly wages of the employees. After leaving the hospital the plaintiff made a claim under the industrial insurance law and accepted a final award. Subsequently this action was brought for the recovery of damages laid in the sum of $15,000, and resulted in a verdict for the plaintiffs in the sum of $1. The court directs that the case be dismissed. The defendants contended that no recovery could be had against either of them, for the reason that plaintiff Ross had been compensated for all injuries resulting from his primary injury, or proximately attributable thereto. The industrial insurance law is grounded in a humanitarian impulse. It takes account only of the place of injury and the extent of the disability, and compensates for the conditions resulting from the primary injury, or, in other words, it will reject no element of disability if it has accrued in consequence of the first hurt, or as an aggravation arising from any collateral contributing cause. The legislature knew that workmen had been compelled to meet the defense of nonliability on the part of the employer, who might plead the malpractice of the attending surgeon as a bar to recovery, and if they pursued their remedy against the malpractitioner they might be subject to the hazard of expert opinion evidence, from which a jury may generally find a sufficient warrant to follow its own inclination. There was no assurance of a recovery against either party, or against either offender. On the other hand, the employer and faithful and competent physicians and surgeons had been put to the hazard of ill-founded suits. The deserving had gone from the courts, their wrongs unredressed. The undeserving had taken that which, in good conscience, was not their own, and to cure all the legislature passed the industrial insurance law covering "all phases of the premises." These things seem clear to the court, but it must be admitted that it is exploring a new field, and there is but little to offer to those who find no assurance for their opinions unless something is found to throw on the shrine of "authority" and "precedent." To all such the court can say no more than that a diligent search has convinced it that there are no cases "in point." But to confirm its conclusion that the consequences of malpractice are an element which will be considered and compensated for by the state, the court can offer a few cases bearing slightly. But it is said that a holding that the master and the surgeon are not liable to answer for an aggravated condition resulting from the ill treatment of a wound, or the malpractice of a surgeon, may result in grievous wrong, in that only a partial recovery may be had. What is or what is not a full recovery in a given case is a relative question, with which the court has nothing to do. It is enough that the legislature has fixed a schedule of recoveries within which the discretion of the commissioners may move, subject to a "court review" as provided in the act, and in lieu of a system that often brought a full recovery in unmeritorious cases, and as often no recovery at all in meritorious cases, it has substituted a system that will insure an award in all cases. Surgical treatment is an incident to every case of injury or accident, and is covered as a part of the subject treated. When a workman is hurt and removed to a hospital, or is put under the care of a surgeon, he is still, within every intendment of the law, in the course of his employment and a charge on the industry, and so continues as long as his disability continues. The law is grounded on the theory of insurance against the consequence of accidents.

Account Taken of Effect on Health of Overflowing Land

(Southern Indiana Power Co. vs. Miller (Ind.), 111 N. E. R. 925)

The Supreme Court of Indiana says that the purpose of this action was to appropriate certain land overflowed by the construction of a dam by the company, and to assess the damages sustained by the owner of the land by such appropriation, or condemnation. Over the company's objection, two physicians were permitted to testify that in their opinion the overflowage from the dam would increase the breeding of mosquitoes along the river, and thus cause malaria among the tenants on the farm of the owner of the land in question. The admission of this evidence was not objectionable. Courts take judicial knowledge of the fact that overflows and floods are followed by disease, and that swampy lands are detrimental to public health. Evidence of witnesses who are properly qualified to show the probable effect of such conditions on those living near is admissible.

Society Proceedings

COMING MEETINGS

Am. Assn. for the Study and Prev. of Inf. Mort., Milwaukee, Oct. 19-21.
Am. Assn. of Obstetricians and Gynecologists, Indianapolis, Sept. 25-27.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Public Health Association, Cincinnati, Oct. 24-27.
American Roentgen Ray Society, Chicago, Sept. 27-30.
Clinical Congress of Surgeons, Philadelphia, Oct. 23-28.
Delaware State Medical Society, Milford, Oct. 9-10.
Idaho State Medical Association, Twin Falls, Oct. 5-6.
Indiana State Medical Association, Ft. Wayne, Sept. 27-29.
Kentucky State Medical Association, Hopkinsville, Oct. 24-27.
Medical Association of the Southwest, Ft. Smith, Ark., Oct. 2-4.
Minnesota State Medical Association, Minneapolis, Oct. 11-13.
Mississippi Valley Medical Association, Indianapolis, Oct. 10-12.
Nevada State Medical Association, Reno, Oct. 10-12.
New England Surgical Society, Boston, Oct. 5-7.
New Mexico Medical Society, Albuquerque, Oct. 11-13.
Southern Medical Association, Atlanta, Nov. 13-16.
Vermont State Medical Society, St. Johnsbury, Oct. 12-13.
Virginia State Medical Society, Norfolk, Oct. 24-27.
Wisconsin State Medical Society, Madison, Oct. 4-6.

COLORADO STATE MEDICAL SOCIETY

Forty-Sixth Annual Session, held at Glenwood Springs, Sept. 5-7, 1916

The President, DR. JOHN R. ESPEY, Trinidad, in the Chair.

Dysmenorrhea

DR. L. G. WELDON, Denver: An operation on the uterine canal for dysmenorrhea when something else is at fault is as much to be criticized and condemned as that of gastroenterostomy done on a patient suffering from a Lane kink. I have demonstrated repeatedly that at the time when pain is most severe in a great many cases there is actually no blood in the uterus and the canal is perfectly free and normal. It is possible that in certain cases when we think the canal is obstructed because we fail to introduce the sound, the latter has merely become lodged in a pocket or fold of the cervical mucosa or met with an acute flexion. Unless the flexions are marked, they are not liable to cause enough obstruction to produce dysmenorrhea.

In 109 cases of dysmenorrhea seen in conjunction with other conditions the displacements were found in 38 per cent., pelvic pathologic conditions in 31 per cent., conditions pertaining to the structure of the uterus in 11 per cent., different forms of adhesions, cicatricial contractions, varicosities, cystic conditions, etc., in about 11 per cent., and mechanical obstructions to the uterine canal, including carcinoma of the cervix and vaginal deformities in 9 per cent.

Of the 109 cases operated on for dysmenorrhea nearly all had the uterine canal dilated and cureted from one to five times and in over 100 of these something definite was found in the pelvis as the unmistakable cause.

If, after using every means at our command in history-taking, physical examination, blood and urine tests, correction of erroneous habits, and rebuilding the general health we can eliminate beyond a reasonable doubt the existence of mechanical or inflammatory trouble in the uterine canal, and find that we can accomplish nothing, then no further time should be lost in going into the abdomen, for there the trouble will be found 99 times out of 100.

DISCUSSION

DR. ELLA MEAD, Greeley: I see many girls who are suffering from dysmenorrhea. Fifty per cent. of them never consult a physician. I suppose that 75 per cent. of the girls who do have dysmenorrhea do not realize that anything can be done for them, and only those who have the most frightful conditions consult physicians. I think constitutional con-

ditions have a great deal to do with these cases of dysmenorrhea. All know the intimate connection between the glandular scretion and the woman's sexual life. Recently gynecologists have spent considerable time in discussing the hypophysis, the thymus, and the thyroid gland in regard to pelvic disturbances, and the thymus and corpus luteum have been used to correct a great many of these disturbances, with gratifying results.

DR. L. C. WELDON: In the cases I have been able to examine regularly the point has been brought out in dysmenorrheal cases that there is a visible turgescence and swelling of the uterus. We may have cases of pelvic infection without a visible sign of redness or swelling, and consequently there is no dysmenorrhea.

New Growths and Infections Associated with and Following Chronic Suppurative Appendicitis

DR. C. E. TENNANT, Denver: Chronic irritation is recognized as a factor in the development of cancer about the stomach and other acid-secreting visceral organs. This theory may account for the rarity of cancer in the intestine and appendix. Meyer reports 269 cases of cancer of the appendix. In a splendid summary of the subject he says that "in carcinoma of the appendix we have a condition formerly believed to be very rare, but now known to occur in 0.5 per cent. of all removed appendices." It is a condition never recognized before operation, and usually unrecognized at the time of the operation, there being only 10 per cent. of removed appendices that are suspected before being sent to the pathologist.

DISCUSSION

DR. EMIL RIES, Chicago: I desire to call attention briefly to the question of pseudo-myxoma peritonei and to the origin of malignant neoplasms on irritated soil, or the question of trauma or irritation carcinoma. Is there one part of the bowel that is more frequently irritated chronically than the appendix, and is there one part of the bowel where there is less carcinoma than in the appendix?

Ulcer of the duodenum is much more frequent than ulcer of the stomach. Have any of you ever seen carcinoma of the duodenum? I have seen two on the operating table in my whole operative experience. I have seen less of carcinoma of the stomach, and if carcinoma of the stomach is caused by ulcer of the stomach, why is it that ulcer of the duodenum, which is more frequent, does not cause carcinoma more frequently?

As to malignant neoplasms of the appendix, as I remember, the literature contains about 300 such cases, including carcinoma. This is a small number of malignant neoplasms in an organ which is notorious for its chronically infected, irritative condition.

Complications Following Operations for Acute Appendicitis

DR. F. N. COCHEMS, Salida: The common complications to which references will be made are: 1. The accumulation of fluid in the pelvis which is frequently overlooked and its proper treatment. 2. Pulmonary embolism. 3. Necrosis of the intestine due to tying off the circulation. 4. Adhesions at the site of the line of incision and method of closing the wound. 5. Perforation of the intestine due to stiff drainage tube. 6. Some points in the treatment of intestinal obstruction accompanying diffuse peritonitis, and obstructions due to other causes.

In acute appendicitis with abscess formation drainage should be instituted immediately and to bring about the most suitable drainage, gravity and capillary attraction should be taken into consideration. A diligent search should be made for fecal concretions in cases of people suffering from appendicitis who are along in years, say above 50, especially in pus cases, lest the stone, which so often in these cases escapes the attention of the operator, is left to produce a varying degree of trouble. We have not used stiff drainage tubes for many years. We prefer the cigaret or plain gauze.

DISCUSSION

DR. J. N. HALL, Denver: I reported some time ago fourteen cases of abscess in the subphrenic space, in the liver or lung, and I have seen many more such cases since that time. There is nothing more distressing than to see the ordinary appendix case which has been neglected in the early stages that is infected, retrocecal in origin, with the infection starting upward. It is not the appendix per se that makes the trouble, but the complications.

Chronic Appendicitis and Its Gastric Relations

DR. H. A. BLACK, Pueblo: In the chronic type of appendicular disease, the pain in the region of the appendix may be entirely absent, and when present, may be characterized by a feeling of distress rather than a clear cut attack. It will at times come on two or three hours after eating, but more often soon after the taking of food. Epigastric pain in these cases may be purely a reflex sensation, or as is probably more frequent, pain actually from the pylorus caused by reflex action on that structure. The cause of recurring gastric distress a few hours after the taking of food is a protective spasm of the pylorus, a clinical entity recognized only in the past few years, and which may be reflexly caused by irritation of the cecum from a chronically inflamed appendix. In all cases where the symptoms point to a chronic gastric disorder, aided by the Roentgen ray and the laboratory, most careful search must be made to determine the causative factor which in no small percentage of cases will be found to be that small outlaw inhabitant of the right iliac fossa.

DISCUSSION

DR. CRUM, Pueblo: We know that a chronic appendix, at times, will create a set of gastric symptoms similar to those associated with gastric ulcer. From a roentgenologic standpoint, we know also there are findings which are not so constant as would appear on first blush to be those of duodenal ulcer.

The Faucial Tonsil in Its Relation to Systemic Conditions

DR. ALEXANDER C. MAGRUDER, Colorado Springs: In cases of recurrent tonsillitis or quinsy, in which the patient is frequently incapacitated, the tonsils should be removed. In cases of malnutrition in children, in which tonsil and adenoids are diseased or obstructive, the removal of these organs gives the most gratifying results. In arthritis and muscular rheumatism, when associated with attacks of tonsillitis, removal of the tonsil alleviates or cures the condition. In enlarged thyroid with hypersecretion (not the colloid form) and in chorea good comes from enucleation of a diseased tonsil. The indiscriminate removal of tonsils is to be condemned not only because it is wrong but because such procedure has caused the laity and some physicians to regard a tonsil enucleation as a minor operation. Diseased tonsils may come to be recognized as one cause of sterility in women.

DISCUSSION

DR. THOMAS E. CARMODY, Denver: The essayist brought up the question as to whether tonsillectomy is a major operation or not. Recently I have performed this operation on two surgeons, and they both agree it is a major operation. I have believed for a long time that the teeth played an important part in some of these cases of tonsillitis, and physicians are awakening to the fact now more than they did a few years ago. We used to think that the removal of the tonsils made the male sterile, but that has been disproved. We all know of cases where couples have been married for years and years and have been sterile until something happened and the women became pregnant.

DR. H. A. SMITH, Delta: In some cases it is better to keep the patient under observation two or three weeks or a month before reaching a decision as to whether the tonsils should be removed. If you find a red line on the external part of the pillar take a hook and draw the pillar forward. If you find inflammation sufficient to justify you in dealing with the tonsil, do so carefully, and perhaps the condition of the patient will clear up.

DR. GERALD B. WEBB, Colorado Springs: I had the pleasure a short time ago of working out one or two cases with Rosenow, and I feel that the reason his work has not been corroborated better by the pathologists of the country is practically the same reason why Pasteur's work was not corroborated and endorsed by his confrères as it might have been in

the early days; namely, because these men do not pay the attention they should to the details and care with which Rosenow carries on his work. In removing an offending organ like the tonsils or decayed teeth, one should not expect too much because bacteria have already settled in other parts of the body.

DR. FRANK R. SPENCER, Boulder: I have personally enucleated tonsils for the following conditions: recurrent acute attacks of tonsillitis, quinzy, arthritis, muscular rheumatism, chorea, tuberculosis, headache, anemia, goiter, cervical adenitis and different types of ear disease. I have not enucleated tonsils for nephritis, peptic ulcer, multiple neuritis, hypertension, appendicitis and sterility in women. I believe if the laryngologist could have the cooperation and advice of a competent internist before completing his diagnosis, there would be fewer errors in advising for or against the removal of the tonsils and laryngology would be placed on a higher plane.

DR. J. W. AMESSE, Denver: Twenty years ago I suffered from diseased tonsils in coming up from Central America, and by the time I reached Baltimore my joints were considerably involved. I went to the Johns Hopkins Hospital. Dr. Porter made cultures from the material removed, and found the *Streptococcus viridans* which, when injected into rabbits, was followed by fatal results. Within two weeks following the removal of my tonsils my joints were relieved, and in a comparatively short time I gained 40 pounds.

Tumors of the Breast

DR. PHILIP HILLKOWITZ, Denver: There are only three pathologic conditions of the breast which the surgeon must keep in view and on whose recognition he shapes his policy of action: 1. The benign tumor known as fibro-adenoma. 2. Cystic disease of the breast. 3. Cancer. The indication for operative procedure in fibro-adenoma is naturally to extirpate the tumor, leaving the rest of the breast intact. As there are no metastases it is needless to touch the axillary region.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

September, CLII, No. 3

1 Diagnosis of Poliomyelitis. J. B. Neal and P. L. Dubois, New York.—p. 313.
2 *Value of Quantitative Estimation (Wolff-Junghans Test) of Dissolved Albumin in Gastric Contents in Diagnosis of Cancer of Stomach. J. Friedenwald and R. F. Kieffer, Baltimore.—p. 321.
3 *Pharmacology of Emetin. E. J. Pellini and G. B. Wallace, New York.—p. 325.
4 *Effects of Retention in Kidney of Media Employed in Pyelography. W. F. Braasch and F. G. Mann, Rochester, Minn.—p. 336.
5 *Transplantation of Thyroid in Dogs. C. Goodman, New York.—p. 348.
6 *Gastric Function in Pulmonary Tuberculosis. H. K. Mohler and E. H. Funk, Philadelphia.—p. 355.
7 Injuries to Peripheral Nerves Produced by Modern Warfare. C. B. Craig, Paris.—p. 368.
8 *Dietetic Management of Hypercholesterinemia in Cases of Cholelithiasis. M. A. Rothschild and N. Rosenthal, New York.—p. 394.
9 Influenzal Meningitis; Report of Case. R. G. Torrey, Philadelphia.—p. 403.
10 Tuberculosis of Tongue; Report of Case. J. R. Scott.—p. 411.
11 *Addison's Disease; Report of Case with Acute Onset, Terminating in Rapid Improvement and Complete Recovery. T. Ticken, Chicago.—p. 422.

2. **Wolff-Junghans Test in Diagnosis of Cancer of Stomach.**—The authors conclude that the Wolff-Junghans test is of great value as an aid in the diagnosis of certain forms of gastric carcinoma. The test is, however, only useful in the diagnosis of the disease, when there is an absence of free hydrochloric acid in the gastric contents, and then only when the question of even traces of blood can be eliminated, and in the absence of all retained food residue or of swallowed saliva or sputum. The test has its greatest significance in the diagnosis between simple and malignant achylias. Positive reactions are rarely observed in simple achylias, while they are frequent in cancer.

3. **Pharmacology of Emetin.**—The following points are emphasized by Pellini and Wallace. Emetin depresses and may eventually paralyze the heart. It is a powerful gastro-intestinal irritant whether given by mouth or subcutaneous injection. It causes a definite derangement of metabolism, characterized by an increase in nitrogen loss and an acidosis. While in normal individuals given moderate doses, these actions may not be of importance, in pathologic states of the circulation, intestinal tract, or metabolism, they may be a very definite source of danger.

4. **Retention of Media Employed in Pyelography.**—Thorium nitrate, in 10 or 15 per cent. solution, Braasch and Mann state is the least harmful and objectionable substance to use in pyelography. Care must be taken in its preparation that the solution is thoroughly neutralized.

5. **Transplantation of Thyroid in Dogs.**—There was not, in the entire series of thirty experimental operations reported by Goodman a single instance of infection. In twelve of these cases, intratracheal anesthesia with the Janeway intratracheal apparatus was used. In the remaining cases ether was administered with an Allis inhaler. Among the homotransplantations there were three instances in which the parathyroid gland remained in a normal state of preservation while the thyroid showed evidences of autolysis. In autotransplantation Goodman succeeded in two consecutive instances in retaining the thyroid in its normal state microscopically. In twenty-five out of thirty instances the segments of the carotid artery remained free from thrombosis and in four instances the superior thyroid artery also remained patent and without any evidences of thrombosis, although the gland transplanted has undergone autolysis and was partly absorbed. The technic employed consists briefly in an implantation of the thyroid underneath the muscles of the neck and a biterminal suture of a segment of the attached carotid of the severed vessel of the host and end-to-end suture of the thyroid vein with the central end of the external jugular of the opposite side.

6. **Gastric Function in Tuberculosis.**—The patients studied by Mohler and Funk comprised twenty-two early and twenty-five advanced cases of pulmonary tuberculosis. Among the early cases, eleven complained of symptoms referable to the gastro-intestinal tract. Of this number three suffered with symptoms prior to and the remaining eight subsequent to the development of cough, fever, etc., symptoms common in early lesions. The gastric symptoms complained of in order of frequency were belching, fulness and distress in the epigastrium, anorexia and vomiting. The high point of total acidity occurred at or before the one and a quarter-hour period in eleven instances. Of these eleven cases three presented gastric symptoms and eight no symptoms. Of the twenty-five advanced cases, twenty-four patients complained of gastro-intestinal symptoms. The morning residuum revealed the presence of mucus, bacteria and leukocytes in excessive amounts in twenty of the cases. The tubercle bacillus was present in the residuum in eighteen cases. The high point for total acidity in this group of cases averaged twenty-four, and for free acidity twenty, distinctly below the normal.

The authors conclude that pulmonary tuberculosis causes a definite downward progression in both the motility and the secretory function of the stomach from the very beginning of the disease. Hyperacidity with symptoms occurring in early stages and described by previous writers as common is quite rare. Even hyperacidity without symptoms is rare—the type which corresponds to the normal "hyperacidity curve" of Rehfuss, existing in 40 to 50 per cent. of normal individuals (Rehfuss), exists considerably less frequently in early tuberculous patients. This would indicate that even in early tuberculous patients, changes in gastric functions are present. The so-called "pretubercular dyspepsias" of previous writers Mohler and Funk believe are in reality manifestations associated with definite tuberculous infection. They do not believe that there is an "irritative stage" goving hyperacidity in early tuberculosis. Their studies suggest that the gastric disorder is the result of disease of the gastric mucosa.

8. **Hypercholesterinemia in Cholelithiasis.**—Exactly as some individuals have a so-called gouty or uric acid diathesis with a retention of uric acid Rothschild and Rosenthal hold that some individuals retain their lipoids and the result is a retention hypercholesterinemia, the excretion of a more or less saturated bile, and ultimate precipitation of the retained cholesterin in the gallbladder, the common duct and its finer radicals. The subsidence of an attack means that the patient has rid himself of the obstruction and will be in good health until the saturation point in the blood and bile is again reached. The recognition of this diathesis is extremely important for the patient. Under proper dietetic management in a large percentage of these cases a secondary operation might be avoided. Hence one should examine the blood of every case of cholelithiasis without jaundice for cholesterin before operation. In the presence of hypercholesterinemia, provision should be made for drainage of the bile to deplete the body of the retained lipoids. The drainage tube should not be removed until the blood and bile show a normal cholesterin content, and during this period the diet should be low in lipoids. Further accumulation of cholesterin can be controlled by dietetic measures, placing the patient on a fat free diet which both excludes lipoids to a large extent and renders difficult the esterization of the free cholesterin in the food.

On a strict, practically lipoid free diet, only vegetables are allowed excluding beans and peas which are fairly rich in a metameric product, phylocholesterin? All other vegetables, as well as cereals and sugars, are allowed. The milk should be skimmed and fat free buttermilk permitted. This diet is so strict that the majority of patients will not maintain it for a long period; therefore, the authors have devised "fast and feast day" periods. For three or four days a week the patient lives on the strict, lipoid free diet outlined above, the so-called fasting periods, which serves to deplete the organism of the stored-up lipoids. For the next three or four days, dependent on the grade of the hypercholesterinemia, a more liberal diet is permitted, the so-called "feast days." On the "feast days" the patient is allowed, in addition to the articles stated above, well-cooked lean meats and fish, excluding salmon, shad and bluefish, the fat content of which is high. Oleomargarin is allowed instead of butter.

11. **Recovery from Addison's Disease.**—The case reported by Tieken occurred in a young man and ran an acute febrile course, with nausea, vomiting, diarrhea and marked asthenia. There was pigmentation of the skin, a low blood pressure, loss in weight, pain in the abdomen and lumbar regions, anemia, insomnia and marked cerebral disturbance. After a period of six weeks the patient began to improve and made a rapid recovery. After two years his health is still good.

American Journal of Orthopedic Surgery, Boston

September, XIV, No. 9

12 Anatomy of Visceroptosis. W. E. Sullivan, Boston.—p. 507.
13 Rôle of Visceroptosis in Etiology of Arthritis Deformans. D. Silver, Pittsburgh.—p. 513.
14 Medical Aspects of Visceroptosis. H. W. Bettmann, Cincinnati. —p. 522.
15 Visceroptosis from Roentgenologist's Viewpoint. F. H. Baetjer, Baltimore.—p. 530.
16 What Evidence Can Be Brought Forward to Show That Visceroptosis is Anything More Than Variation from Anatomic Norm and is of Frequent Causative Clinical Significance? R. B. Osgood, Boston.—p. 533.
17 Case of Fracture of Odontoid Process of Axis. P. Le Breton, Buffalo.—p. 549.

American Journal of Public Health, Boston

August, VI, No. 8

18 Improvement of Cancer Mortality Statistics in United States. C. E. Lakeman, New York.—p. 791.
19 Organizing State Campaign of Public Health Education. C.-E. A. Winslow, New Haven, Conn.—p. 805.
20 Suppression of Drug Vice Considered from Demand Side. J. F. Chase, Boston.—p. 814.
21 Physical Examination of Employees. J. B. Andrews.—p. 825.
22 Latest Features in Diagnosis and Prevention of Some of Occupational Poisonings. W. H. Rand, Washington, D. C.—p. 830.
23 Scientific Management in Industry and What It Includes. G. M. Price, New York.—p. 836.
24 Comparison of Bacteriologic Methods for Examination of Oysters. C. Bates and L. A. Round, Washington, D. C.—p. 841.
25 Other Factors in Infant Mortality Than Milk Supply and Their Control. G. L. Meigs, Washington, D. C.—p. 847.
26 Milk Clarifiers. C. Bahlman, Cincinnati.—p. 854.
27 Fundamental Distinctions Between Larger and Smaller Cities in Health Administration. W. E. Park, Rockford, Ill.—p. 858.
28 Homogenized Milk and Cream. H. B. Baldwin, Newark, N. J. —p. 862.
29 Accuracy of Diagnosis of Municipal Health Conditions Based on Vital Statistical Data. F. C. Gram, Buffalo.—p. 865.
30 Water Chlorination Experiences at Toronto, Canada. F. Adams, Toronto, Canada.—p. 867.
31 Efficiency in Worker and Its Maintenance. W. I. Clark, Worcester.—p. 870.

Boston Medical and Surgical Journal

September 7, CLXXV, No. 10

32 Some Theoretic Considerations on Present Status of Roentgen Therapy. J. Shohan, Boston.—p. 321.
33 Some Efficiency Problems in Country Medical Practice. F. H. Washburn, Holden.—p. 328.
34 Circulatory Disturbance in Obese. C. L. Buck, Danvers.—p. 332.
35 Jean-Pierre David; The Man Who Potted Pott. J. Ridlon, Chicago.—p. 336.
36 Clinical Symptomatology and Laboratory Findings in Three Cases of General Paresis Under Intravenous Arsenobenzol Treatment. G. E. Mott and S. M. Bunker, Worcester.—p. 338.

Journal of Cutaneous Diseases, Boston

September, XXXIV, No. 9

37 *Principles of Treatment of Syphilis. S. Pollitzer, New York.—p. 633.
38 *Transmission of Syphilis; With Particular Reference to Paternal Source of Infection. U. J. Wile, Ann Arbor, Mich.—p. 645.
39 Meningococcus Meningitis with Unusual Purpuric Manifestations; Demonstration of Diplococcus in Skin. C. T. Sharpe, New York.—p. 659.
40 Histopathology. W. J. Heimann, New York.—p. 664.

37. **Treatment of Syphilis.**—Pollitzer's plan of treatment may be summarized as follows: Specific therapy should be instituted at the earliest possible moment after a positive diagnosis is made. Three injections of salvarsan should be administered in large doses, at intervals of twenty-four hours, and followed by a course of eight weekly injections of salicylate of mercury. If the treatment was begun before the appearance of the roseola, there is a strong presumption of cure and the case may remain under observation without further treatment. When the treatment is begun after the appearance of a rash, the first course of salvarsan and mercury is repeated after a pause of two months, and again after another similar interval. After three courses within the first year, if the Wassermann reaction has remained negative, further treatment may await the reappearance of a positive Wassermann reaction. In cases which come under treatment a year or more after infection, treatment should be continued till the Wassermann reaction becomes negative, and thereafter two more courses of treatment should be administered, even though the Wassermann reaction remains negative. After a year or more of constantly negative Wassermann reactions without treatment, the cure should be tested by a provocative injection of salvarsan and by an examination of the spinal fluid.

38. **Transmission of Syphilis.**—Wile's observations have led him to believe that a paternal inheritance usually results in expulsion of the fetus before birth in the first pregnancies and stigmatized children, if such are born alive, in the later pregnancies. Maternal infection, therefore, would not be hereditary, but would be an acquired form of syphilis, except when the syphilis is recent in the mother. For those cases in which maternal infection results in expulsion of the fetus, one would have to presume the unfertilized ovum to be the seat of the resting or active stage of the spirochete, as may occur with the male germ cell. That such is infrequent is established by the pathology of ovarian syphilis. Paternal infection, therefore, would be for the most of the cases, the commonest mode of transmission. With regard to placental transmission, Wile states that the weight of evidence is more in favor of a fetal infection of the placenta than of infection of the placenta by the mother. The complement binding substances passing through readily from the fetus to the mother, suggest an explanation for the uniformly posi-

tive tests in the mother and the otherwise inexplainable phenomenon that most of such mothers go through life Wassermann positive, without ever having clinical syphilis.

Journal of Infectious Diseases, Chicago

September, XIX, No. 3

41 Comparison of Rapid Method Lilliputian Plate Cultures of Counting Bacteria in Milk with Standard Plate Method. W. D. Frost, Madison, Wis.—p. 273.
42 Adaptation to Certain Tensions of Oxygen as Shown by Gonococcus and Other Parasitic and Saprophytic Bacteria. W. B. Wherry and W. W. Oliver, Cincinnati.—p. 288.
43 Leptothrix Innominata (Miller). W. B. Wherry and W. W. Oliver, Cincinnati.—p. 299.
44 Filterability of Bacillus Bronchisepticus. W. B. Wherry, Cincinnati.—p. 304.
45 New Model of Double Pipet Holder and Technic for Isolation of Living Organisms. F. Hecker, Kansas City, Mo.—p. 306.
46 *Complement Fixation in Tuberculosis. H. J. Corper, Chicago.—p. 315.
47 *Studies on Acquired Typhoid Immunity. F. W. Hachtel and H. W. Stoner, Baltimore.—p. 322.
48 *Causation of Gastric and Duodenal Ulcer by Streptococci. E. C. Rosenow.—p. 333.
49 Studies on Forage Poisoning. R. Graham and L. R. Himmelberger, Lexington, Ky.—p. 385.
50 Spontaneous Amebic Dysentery in Monkeys. A. Eichhorn and R. Gallagher, Washington, D. C.—p. 395.
51 Strength and Composition of Blackleg Vaccines. O. M. Franklin and T. P. Haslam, Manhattan, Kan.—p. 408.
52 *Bacteriology of Urine in Lobar Pneumonia. G. Mathers, Chicago.—p. 416.
53 Pathology of Dermatitis Venenata from Rhus Diversiloba. J. B. McNair, Berkeley, Calif.—p. 419.
54 Transmission of Rhus Poison from Plant to Person. J. B. McNair, Berkeley, Calif.—p. 429.
55 Refinement and Concentration of Antitoxins. P. G. Heinemann, Chicago.—p. 433.
56 Cytology of Exudate in Early Stages of Experimental Pneumonia. F. A. Evans, New York.—p. 440.
57 Agglutinins in Hog Cholera Immune Serum for Bacillus Suipestifer. H. Wehrbein, Ames, Iowa.—p. 446.
58 *Colloidal Chemistry and Immunology. M. von Krogh, Argentine.—p. 452.
59 *Experimental Scurvy in Guinea-Pigs. L. Jackson and J. J. Moore, Chicago.—p. 478.
60 *Bacteriologic Studies on Experimental Scurvy in Guinea-Pigs. L. Jackson and A. M. Moody, Chicago.—p. 511.
61 *Lesions in Rabbits Produced by Streptococci from Chronic Alveolar Abscesses. A. M. Moody, Chicago.—p. 515.

46. **Complement Fixation in Tuberculosis.**—The examination by Corper of 361 persons (25 of them normal, 11 questionably nontuberculous, and 325 definitely tuberculous), using both an emulsion and an autolysate prepared from living virulent human tubercle bacilli as antigens, shows that: (*a*) The complement fixation test for tuberculosis is not absolute, being positive only in about 30 per cent. of all the clinically definite cases of tuberculosis both active and inactive. Active cases give a higher percentage of positive results than inactive cases. (*b*) The value of the complement fixation test for tuberculosis lies in the fact that, taken in conjunction with other findings, a definitely positive reaction makes the diagnosis of tuberculosis certain. (*c*) It is of value also from a differential diagnostic standpoint in that it indicates tuberculosis, when positive, as against syphilis, carcinoma, abscess of the lung, empyema from other causes, bronchiectasis, etc. Corper points out that the practical absence of a reaction in nontuberculous cases makes this test, when positive, of far greater value in the diagnosis of tuberculosis than any of the biologic tests for tuberculosis thus far discovered. A positive test was never obtained in the absence of a positive von Pirquet reaction, but a large percentage of clinically normal individuals giving positive von Pirquet reactions were negative in fixation tests.

47. **Acquired Typhoid Immunity.**—The experiments reported on by Hachtel and Stoner were too few to form the basis of any dogmatic statement, but it would seem that the immunity following inoculation is due to a training of the cells in the production of antibodies so that afterward they yield these more prolifically.

48. **Gastric and Duodenal Ulcer.**—Streptococci having a characteristic affinity, for the stomach and the duodenum, have been repeatedly isolated by Rosenow from various foci of infection in patients with ulcer and from the ulcers themselves. They tend to disappear from the circulation and do not commonly produce marked lesions otherwise. They have been isolated from ulcers in animals, and ulcer has again been produced on their reinjection. Filtrates of these cultures show no special tendency to produce ulcer. The necessary requirements have been fulfilled to warrant the conclusion that the usual ulcer of the stomach and of the duodenum in man is primarily due to a localized hematogenous infection of the mucous membrane by streptococci. Rosenow's clinical and experimental observations on which this conclusion is based are reported in detail.

52. **Urine in Lobar Pneumonia.**—Mathers found that during the course of an attack of lobar pneumonia, pneumococci may be excreted in the urine. They appear in the urine usually at a time just before or just after the crisis and do not seem to bear any definite relation to the other pathologic elements in the sediment. The pneumococcus strains isolated from the urine in Mather's experiments are similar to those found in the blood and the sputum hence a possible source of infection. Incidentally urinary cultures may be of great value in the diagnosis of pneumonia or of pneumococcal infections in general.

58. **Colloidal Chemistry and Immunology.**—It appears probable from von Krogh's analytical review that in the blood under normal as well as pathologic circumstances, in vitro as well as in vivo, there takes place a very complicated ensemble between several ferments and antiferments, all of them colloid substances whose degree of dispersity has great influence on their effect. And more, the equilibrium of these substances in a very labile one, so that a small change may give opportunity for the most far-reaching alterations. So it may be possible that the colloidal changes which take place through the union of antigen and antibody may disturb the equilibrium of the whole system and inactive ferments of any nature may be activated or active ferments put out of action by adsorption to the new formed colloidal union. Von Krogh suggests the possibility that the pathogenesis of a great many of the infectious diseases may be explained from this point of view; namely, that the living bacteria or protozoa disturb the colloidal equilibrium of the liquids of the organism and so put normal ferments out of action or pathologic ferments into activity. Theoretically such a process appears very probable, but as yet there is no experimental support for it.

59. **Experimental Scurvy in Guinea-Pigs.**—Experimental scurvy was produced in guinea-pigs by Jackson and Moore by diets of pasteurized, raw, boiled, skimmed and condensed milk, streptococcus broth and milk, milk and green vegetables, thyroid extract and milk, casein and water, oats, bread and bran. The addition of calcium lactate to milk or the injection of calcium lactate into guinea-pigs on a milk diet did not prevent scurvy. A cream diet, and a diet of olive oil added to milk, produced a "fat constipation" with early death. Daily injections of olive oil into animals on a milk diet had no antiscorbutic effect. Mixed broth cultures of *Streptococcus viridans* and *Streptococcus hemolyticus*, water, lactose water, and lime water did not produce scurvy. In a series of six guinea-pigs fed on goat's milk for over forty days, no symptoms of scurvy developed. The average time for the onset of symptoms with pasteurized milk was nineteen days. With other milk diets this varied from eleven to nineteen days. The earliest lesion was observed on the tenth, the latest on the twenty-ninth day. Cultures of the heart blood from guinea-pigs with scurvy from milk diet were sterile, and passage of blood from these animals to normal animals did not produce the disease.

60. **Experimental Scurvy in Guinea-Pigs.**—Bacteriologically, cultures of crushed tissue resulted in the isolation of a diplococcus of low virulence with a tendency to form chains and produce green on blood agar. Pure strains of these organisms inoculated into the circulation of guinea-pigs and rabbits living under ordinary conditions (a mixed diet consisting of green vegetables, hay and oats) gave rise in most instances to hemorrhagic and other lesions in the bones, joints, muscles, lymph glands, or gums. Streptococci of the same type as those injected were recovered from the lesions in these animals as late as forty days after a single intra-

cardiac or intravenous injection. Bacteria resembling the organisms described were frequently seen in the microscopic sections of the scurvy lesions. When animals, which had artificially received these streptococci in the circulation had their resistance kept high by proper feeding, the lesions produced did not have the same tendency to progress that was seen in animals receiving an unbalanced diet. Cultures of the heart blood from the affected guinea-pigs were sterile and passage of blood from an affected animal to a normal animal failed to produce the disease.

61. **Pathogenicity of Streptococci from Alveolar Abscesses.**—One hundred and seventy-eight rabbits were injected by Moody with pure strains of *Streptococcus viridans*, isolated from pyorrhea pockets at the roots of teeth and having no connection with the mouth cavity. Fifteen patients suffered from chronic alveolar abscess and artericular rheumatism; fifteen suffered from chronic alveolar abscess and some systemic disorder other than articular rheumatism; nineteen suffered from chronic alveolar abscess unaccompanied by any other illness. Lesions were produced more frequently in the stomach, muscles, joints, endocardium, kidneys and jaws in the order mentioned. Strains isolated from the patients having articular rheumatism (Group A), as a rule, produced a higher percentage of lesions in the usual regions of localization than did strains from patients in the other groups. There were, however, certain variations, the most notable being the production of hemorrhages in the stomach by organisms from Groups B and C. The gross lesions were chiefly hemorrhages of varying degrees of intensity and, in many instances, suppuration. Suppuration was most common in the joints. In the heart small hemorrhages occurred in the endocardium, especially in the right ventricle near the base of the tricuspid valve.

The kidneys revealed small hemorrhagic foci usually beneath the capsule and scattered throughout the cortex. There were very few instances of the development of an acute diffuse nephritis, but many instances of marked acute fatty changes. In the lower jaw below the incisor teeth and beneath the periosteum, there frequently were seen marked hemorrhages. Bacteria could be demonstrated in them. A suppurative cholecystitis developed in one animal. *Streptococcus viridans* was recovered from the pus in pure culture. The other instances of gallbladder involvement were characterized by the presence of small hemorrhages in the mucosa. Lesions in the other organs and tissues of the inoculated animals were marked by the presence of small focal hemorrhages. Microscopic examination, so far as made, corroborated the gross findings.

Journal of Nervous and Mental Disease, Lancaster, Pa.

August, XLIV, No. 2

62 Intramedullary Tumor of Cervical Cord, Diagnosis, Removal in Two Stage Operation; Gradual Improvement. F. X. Dercum and J. C. Da Costa, Philadelphia.—p. 97.
63 Cause of Allorhythmic Type of Tremor in Paralysis Agitans. L. J. Pollock, Chicago.—p. 104.
64 *Werdnig-Hoffmann Early Infantile Progressive Spinal Muscular Atrophy. M. A. Bliss, St. Louis.—p. 108.
65 Family Spastic Paralysis; Report of Four Cases. (To be continued.) J. H. W. Rhein, Philadelphia.—p. 115.

64. **Progressive Spinal Muscular Atrophy in Infants.**—Bliss reports three cases of a familial form of early infantile paralysis in a family group of four children. All of the children had drooling, their feet began to turn and droop at about the same age and the same dragging of one foot at the first and the same tired expression after a time and the same peculiar odor of the passages. All of them at about the same age, 16 months, had a bright rosy spot on each cheek. After a time this faded and left them pale. The spots were not like the normal rosy cheeks of a baby but were reddish spots about the size of a half dollar. All three children had attacks of rigidity. The clinical history of these cases is as follows: An apparently healthy and intelligent child, who had made the normal progress of an infant for the first few weeks or months of life, begins, without sudden onset, and without obvious cause, to lose power. The weakness is first noticed in the legs and in the hips; as the disease progresses the lower portion of the back becomes affected, so that the child is no longer able to sit up. The disease pursues a progressive course, the shoulders, thighs, upper arms, forearms and legs being successively involved, and finally the muscles of the hands and feet. Fibrillar twitching of the muscles may be present, bulbar symptoms may supervene, and contraction of the limbs may be present in some cases. The limbs are usually absolutely flaccid, and the deep reflexes are abolished. There is no pain or tenderness, and no disturbance of sensation. The disease runs a slowly progressive course, death taking place from failure of respiration or bronchopneumonia.

Journal-Lancet, Minneapolis

August 15, XXXVI, No. 16

66 Physician and State. H. M. Bracken, St. Paul.—p. 467.
67 Submucous Resection of Septum. G. Golseth, Jamestown, N. D. —p. 471.
68 Foreign Bodies in Urinary Bladder. E. S. Judd, Rochester.—p. 474.
69 Bacteriemia; Report of Case. W. F. Sihler and T. A. Peppard, Devils Lake, N. D.—p. 477.
70 Rubber Apparatus for Application of Heat to Growths, Cancerous or Otherwise. C. M. Adkins, Grygla.—p. 479.
71 Yeast Infection of Throat; Report of Case. W. F. Wilson, Lake City.—p. 481.
72 Therapeutics in Children. M. J. Hammond, Watertown, S. D. p. 482.

September 1, No. 17

73 Narcolocal Anesthesia in Surgical Work. R. E. Farr, Minneapolis. —p. 499.
74 Is Insanity Increasing? W. M. Hotchkiss, Jamestown, N. D.—p. 504.
75 Fractures of Leg; End-Results in One Hundred Consecutive Cases. F. E. Clough, Lead, S. D.—p. 509.
76 Fat Content of Sputum. J. W. Cox, University, N. D.—p. 515.

Medical Record, New York

September 2, XC, No. 10

77 Classification of Epilepsies. E. C. Fischbein, Sonyea.—p. 339.
78 Clinical Manifestations of Animal Protein Poisoning. R. C. Brown, Milwaukee, Wis.—p. 407.
79 Some Clinical Aspects of Radium Therapy. W. B. Chase, Brooklyn.—p. 410.
80 Eclampsia, Preventable Disease. J. W. Winston, Norfolk, Va.—p. 414.
81 Pellagra; Its Etiology and Treatment. J. F. Yarbrough, Columbia, Ala.—p. 416.
82 Wassermann Reaction in Two Hundred and Fifty-One Tuberculous Dispensary Cases. W. R. Jones, Seattle, Wash.—p. 418.

Michigan State Medical Society Journal, Grand Rapids

September, XV, No. 9

83 Review of Medicine and Surgery, with Especial Reference to European War. A. W. Hornbogen, Marquette.—p. 415.
84 Early History of Michigan's State Board of Health. H. B. Baker, Holland.—p. 424.
85 Safety-Pin in Esophagus in Infant Fifteen Weeks Old, Successfully Removed by Gastrostomy. R. H. Crissey, Lansing.—p. 427.
86 Anomalies of Fifth Lumbar in Relation to Backaches. J. G. Van Zwaluwenburg, Ann Arbor.—p. 428.
87 Case Resembling Sprue. H. B. Schmidt, Ann Arbor.—p. 432.
88 Case of Atonic Senile Ectropion Treated by Plastic Operation. G. Slocum, Ann Arbor.—p. 434.
89 Results After Prostatectomy. I. D. Loree and R. W. Kraft, Ann Arbor.—p. 435.

Missouri State Medical Association Journal, St. Louis

September, XIII, No. 9

90 *Atony, Basic Factor of Most Alimentary Pathology. J. M. Bell, St. Joseph.—p. 425.
91 *Stomach Troubles — Their Significance. F. Reder, St. Louis.—p. 427.
92 Duodenal Alimentation; Report of Cases. J. W. Larimore, St. Louis.—p. 430.
93 *Obligations of Physicians; How May They Best Be Met? W. S. Allee, Olean.—p. 433.
94 Selective Effect of Irradiation on Living Cells. W. L. Brosius, Gallatin.—p. 437.
95 *Raw Starch in Treatment of Diabetes. E. B. Knerr, Kansas City. —p. 442.
96 Cardiac Arrhythmias. M. P. Overholser, Harrisonville.—p. 445.
97 Roseola Infantum, or Rubella? J. Zahorsky, St. Louis.—p. 448.
98 Importance of Eye-Ground Findings in Diagnosis and Prognosis of Bright's Disease. J. E. Jennings, St. Louis.—p. 451.
99 School Child in Its Relation to Eugenics. H. E. Gerwig, Downing. —p. 454.

90, 91 and 93. Abstracted in THE JOURNAL, June 24, pp. 2119 and 2120.

95. **Diabetes Treated with Raw Starch.**—The carbohydrate par excellence for the diabetic Knerr has found to be raw starch. It matters not what variety of starch be utilized, provided it be raw and uncooked. Knerr has fed as much as 3 ounces of raw corn starch daily and the stools on subsequent examination failed to show any undigested starch. American corn starch as ordinarily marketed in paper boxes for culinary uses is ideal for this purpose. Also washed potato starch is good. This may be prepared by stirring the grated potatoes in a large volume of water and decanting the floating pulp from the settled starch after a few minutes' standing. Or the potatoes may be eaten raw, seasoned with a little salt. A rounding teaspoonful of the raw starch of whatever variety taken three or four times daily stirred in a glass of water is about the average quantity required, provided a fair supply of green vegetables is also taken, either as salads or boiled.

Briefly, the Knerr treatment of the diabetic is as follows: First place him in a hospital or sanatorium, away from the meddlesome temptations of his friends; then place him on raw starch and water only, until he has burned out all the sugar in his system and circulation. This may require from one to four days, though the glycosuria usually disappears in from twenty-four to thirty-six hours. The patient may lounge about his room as he pleases, but he must keep himself warm. A dram of starch in a glass of water every two hours is all the nutriment allowed until the urine is sugar free. Also a daily sponge and rub is ordered. As soon as the sugar is out of the urine the patient may be allowed some green vegetable, as lettuce or celery, with a little salt and a soft egg. This allowance is gradually increased from day to day by the addition of meats and boiled vegetables, all the while with the continuation of the raw starch, though taken less frequently as the vegetables increase. However, the dram of raw starch three times daily should be continued for months and perhaps a year or more, depending on the case. All direct sugars and cooked starchy foods are prohibited indefinitely. After a patient has been sugar free for some months, an occasional indulgence in bread or toast may be allowed. Should his sugar return at any time the patient must at once drop back to only starch and water for a day or two until he is free again.

Modern Hospital, St. Louis

September, VII, No. 3

100 **Proposed Numerical System of Hospital Records.** A. H. Miller, Providence.—p. 185.
101 **Plumbing and Hot Water Systems for Hospitals.** F. Sutton, New York.—p. 196.
102 **Private Room Building of Robert Packer Hospital.** O. H. Waltz and D. Guthrie, Ithaca, N. Y.—p. 198.
103 **Small Community Hospital — Planning.** J. A. Hornsby, Chicago. —p. 202.
104 **Canned Vegetables — Food Value and Trade Methods.** J. P. Street, New Haven, Conn.—p. 205.
105 **Value of Employees' Medical and Social Service Departments.** A. P. McCleery, Chicago.—p. 208.
106 **Ward Patient at Sloane Hospital for Women, New York City.** M. E. Hutchison, New York.—p. 210.
107 **New General City Hospital, Aurora, Illinois.** N. B. Jordan and R. S. Shepardson, Aurora, Ill.—p. 213.
108 **Efficient Heating for Institutional Groups.** A. L. Baum, New York.—p. 217.

Nebraska State Medical Journal, Omaha

August, I, No. 2

109 **Pancreatic Cyst in Boy Eight Years Old.** G. P. Shidler, York.—p. 35.
110 **Operative Treatment of Trachoma, and Its Complications.** H. Davis, Genoa.—p. 37.
111 **Plea for Conservatism in Treatment of Acute Otitis Media.** W. P. Wherry, Omaha.—p. 40.
112 **Multiple Abscesses of Liver Following Unrecognized Appendicitis.** K. S. J. Hohlen, Lincoln.—p. 45.
113 **Chorea and Tonsils.** L. B. Bushman, Omaha.—p. 47.
114 **End Result of Tonsil Enucleation.** F. F. Teal, Lincoln.—p. 48.
115 **Diagnosis of Pituitary Tumor.** J. B. Potts, Omaha.—p. 52.
116 **Inadequacy of Privately — Feed Medicine.** I. C. Philbrick, Lincoln.—p. 54.

New Orleans Medical and Surgical Journal

September, LXIX, No. 3

117 **Disease and Death Rate in Human Types.** R. B. Bean, New Orleans.—p. 175.
118 **Pulmonary Syphilis; Report of Case.** J. M. Perret, New Orleans. —p. 191.
119 **Some Questionable Forms of Prescribing.** O. W. Bethea, New Orleans.—p. 197.
120 **Vaccine Treatment of Whooping Cough.** C. J. Bloom, New Orleans.—p. 200.
121 **Enucleation of Eyeball and Faulty Technic Cosmetically Considered.** T. J. Dimitry, New Orleans.—p. 205.
122 **Interstitial Pregnancy.** W. Kohlmann, New Orleans.—p. 210.

New York Medical Journal

September 2, CIV, No. 10

123 **Pyorrhea Alveolaris.** J. A. Roddy, E. H. Funk and D. W. Kramer, Philadelphia.—p. 433.
124 **Preexisting Condition of Injured. (To be concluded.)** G. R. Doré, Bordeaux, France.—p. 439.
125 **Therapeutic Applications of Human Thyroid Extract.** S. P. Beebe, New York.—p. 445.
126 **Syndrome of Asthenia, of Mental Origin.** M. Solomon, Chicago. —p. 449.
127 **Spasmus Nutans.** M. B. Gordon, New York.—p. 453.
128 **Primary Perithelial Sarcoma of Spermatic Cord; Report of Case.** A. Brand, New York.—p. 454.
129 **Heart Disorders in Children.** J. Epstein, New York.—p. 456.
130 **Graves' Disease.** C. H. Keogh, Chicago.—p. 457.

Ohio State Medical Journal, Columbus

September, XII, No. 10

131 **Sewage Pollution of Streams in Relation to Public Health.** W. H. Frost, Cincinnati.—p. 597.
132 **Murphy's Operation for Prolapse of Uterus.** M. Millikin, Hamilton.—p. 603.
133 **Intranasal Tear Sac Operation.** W. Mithoefer, Cincinnati.—p. 604.
134 **Study of Typhoid in Ohio.** F. G. Boudreau, Columbus.—p. 608.
135 **Merits and Dosage with Method of Administration of Antitoxin in Diphtheria; Report of Case.** A. J. Bell, Cincinnati.—p. 618.

Ophthalmic Record, Chicago

September, XXV, No. 9

136 **Eye, Ear, Nose and Throat in Diseases of Thyroid and Thymus.** H. Lisser, San Francisco.—p. 433.
137 **Preservation and Mounting of Eye Specimens for Museum and Teaching Purposes.** H. Albert and V. Bennett, Iowa City, Ia. —p. 441.
138 **Case of Unilateral Wood Alcohol Retrobulbar Neuritis.** H. W. Cowper, Buffalo.—p. 452.
139 **Massage of Eye.** O. Wipper, Chicago.—p. 454.
140 **Case of Divergent Strabismus Coupled with Autonomic Control of Refractive Status of Eyes and Treatment.** C. Sheard, Cleveland. —p. 455.

Providence Medical Journal

September, XVII, No. 5

141 **Light Under Bushel.** W. McDonald, Jr., Providence.—p. 232.
142 **Internal Secretions and Mental Disease.** A. H. Ruggles, Providence.—p. 240.
143 **Subphrenic Abscess.** C. E. Hawkes, Providence.—p. 251.
144 **Use of Glatzel Mirror in Rhinology.** J. W. Leech, Providence.—p. 268.
145 **Harrison Law.** J. J. Pastille, Providence.—p. 279.

Washington, D. C., Medical Annals

September, XV, No. 5

146 **Case of Streptococcus Meningitis.** B. M. Randolph, Washington. —p. 299.
147 **Pott's Disease in Adults; Report of Sixty-One Cases.** T. M. Foley, Washington.—p. 303.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, London

July, IV, No. 13

1 Tetanus. C. H. Browning.—p. 14.
2 Case of Tetanus of Paraplegic Type. E. N. Burnett and W. Tulloch.—p. 43.
3 Case of Tetanus Localized to Right Arm. E. Ritson.—p. 48.
4 Generalized Tetanus. Death from Pneumonia. E. Ritson.—p. 49.
5 Suggestions for Treatment of Fractured Jaws. A. C. Valadier.—p. 64.
6 Contemporary American Surgery. G. W. Crile.—p. 74.
7 Shrapnel Wound of Posterior Wall of Pericardium; Removal of Missile. R. S. Skirving.—p. 96.
8 Gunshot Wound of Pericardium and Heart; Pneumohemopericarditis; Operation; Recovery. L. Jones.—p. 103.
9 Pituitary Fossa; Methods of Surgical Approach. V. Z. Cope.—p. 107.
10 Tunnels and Large Cavities in Bone. N. F. Lock.—p. 145.
11 Treatment of Tuberculosis of Spine. F. McG. Loughnane.—p. 156.

12 Traumatic and Arteriovenous Aneurysm. R. J. Swan.—p. 169; C. H. Whiteford—p. 179 and J. L. Joyce—p. 181.
13 Surgical Anatomy of Synovial Membrane of Knee Joint. A. Fullerton.—p. 191.

Journal of Tropical Medicine and Hygiene, London

August 15, XIX, No. 16

14 Case of Cataleptic Trance. J. A. Haran.—p. 189.
15 Measurements of Dutton and Todd's Gambia Strain of Trypanosoma Gambiense Dutton, 1902. A. J. Chalmers and W. R. O'Farrell.—p. 189.

Lancet, London

August 26, II, No. 4852

16 Educational Number.—p. 353.

Practitioner, London

August, XCVII, No. 2

17 *New Method of Bloodless Circumcision. H. Curtis.—p. 101.
18 Hyperalgesia in Abdominal Disease. D. Ligat.—p. 106.
19 Reaction of Child to Faulty Environment. H. C. Cameron.—p. 137.
20 Vicious Circles in Disease and Nature's Efforts to Deal with Them. F. P. Weber.—p. 145.
21 Acute Local Pyrexia. J. H. Wilson.—p. 149.
22 Dermatitis Due to Hair-Dyes. J. L. Bunch.—p. 173.
23 Report on Six Months' Gynecologic Operations. A. B. Lindsay.—p. 180.
24 Case of Extensive Malignant Ulceration Treated by Roentgen Rays. F. Hernaman-Johnson.—p. 188.
25 Ether and Chloroform Anesthesia. R. E. Humphrey.—p. 191.

17. **Bloodless Circumcision.**—The method devised by Curtis is briefly as follows: On either side of the median dorsal line, the prepuce is seized between two pairs of forceps, the points of which are pushed right up to the level of the corona glandis. The prepuce between the clamps is slit up to the corona into two lateral flaps each of which is clamped from below upward, at a distance of about one sixth of an inch from its attachment in the circumcoronal region. The clamp, in the case of each flap, is applied with the point directed upward and inward, that is, toward the median dorsal line, the angle of union of the blades being made to lie at a point about one sixth of an inch distant from the frenum. More than one clamp is generally necessary, and to secure bloodlessness, it is essential to apply the second, or higher clamp, so that there is no interval of prepuce left unclamped between the first and second (or more) clamps, from which oozing could subsequently occur. With a catgut suture, threaded at both ends with short straight needles, perforate the flap just proximal to the clamp, from mucous membrane to skin, pulling the catgut nearly halfway through, so that the midpoint of the suture will lie over the free lower margin of the flap, close to the frenum. A second needle is then passed in the opposite direction, from skin to mucous membrane, through the same stitch hole, and the ends of the suture are drawn taut, much as is done in stitching a boot. This maneuver is repeated to the other end of the flap, passing the needles in opposite directions from mucous membrane to skin, and vice versa, the two needles always passing through one and the same aperture, until the upper cut edge, near the median dorsal line, is reached. The ends of the suture are drawn comfortably taut and tied. The other lateral flap is similarly stitched. The ends of this second suture being drawn taut and tied, are then tied to one or both ends of the first suture. The clamps are then removed from the flaps, and the redundancy trimmed off all round, just distal to the suture line, completing the operation. The hemorrhage should be nil.

Bulletin de l'Académie de Médecine, Paris

August 8, LXXVI, No. 32, pp. 107-120

26 Transient Albuminuria a Common Biologic Incident in the Healthy. (Sur les albuminuries transitoires.) Capitan.—p. 107.
27 *The Iodin Urine Reaction. Petzetakis.—p. 110.
28 *Serotherapy in Typhoid. A. Rodet.—p. 114.
29 Smallpox at Marseilles in 1913-1916. Arnaud.—p. 116.
33 *Revival of Ancient Endemic Focus of Malaria in France. (Reviviscence d'un ancien foyer de paludisme autochtone dans la vallée de la Seille.) G. Etienne.—p. 118.

27. **The Iodin Reaction in the Urine.**—Petzetakis' so-called "new iodoreaction" was described in these columns September 16, p. 911, abstract 60. In 76 cases of pulmonary tuberculosis the findings were constantly negative in a group of 33, none of whom have died during the four months since. In 12 with a slightly positive reaction, one died the fortieth day, and 2 died in a group of 10 giving a positive reaction, and 15 of 21 giving a very strong reaction—all within two months.

28. **Serotherapy in Typhoid.**—Rodet is convinced that serotherapy shortens the course of typhoid when begun in time. The difference in the outcome according to the date it is begun testifies further to its efficacy. The average duration of the disease was 23.7 days among 167 typhoid patients given serum treatment before the eleventh day, and thirty-three days in twenty-eight who did not receive it till later. Any associated infection impairs its action.

30. **Revival of Malaria in French Valley in War Zone.**—Etienne relates that malaria had long been endemic in the Seille Valley, which is infested with the malaria mosquito, but he had not known of any new case since 1888 until last year. In 1915 a number of new cases were encountered, all in persons who had never been in tropical or other malarial regions. He thinks it probable that troops from Africa and French China have brought virulent malaria parasites into the country, and thus the mosquitoes are serving anew as intermediary hosts.

Presse Médicale, Paris

August 17, XXIV, No. 46, pp. 361-368

31 *Technic for Gastrectomy with End-to-Side Gastrojejunostomy. (Cure radicale du cancer du pylore.) V. Pauchet.—p. 361.
32 Can There Be an Ideal Antiseptic? A. Jousset.—p. 364.

31. **Gastrectomy for Cancer of the Pylorus.**—Pauchet's article is accompanied by sixteen illustrations showing the various steps of the end-to-side gastrojejunostomy which he advocates. The stump of the duodenum left projecting is capped with a piece of the gastrohepatic ligament drawn down for the purpose. He advises lavage of the stomach before the operation not only to clear it out but also to train it in this exercise, as it may be necessary after the operation if the patient vomits or has fever. He has the patient wrapped in cotton from head to foot the day of the operation, and gives him subcutaneously from 1 to 3 liters of physiologic serum with sugar. He always prefers regional anesthesia as general anesthesia is too dangerous on account of lung complications. It generally has to be supplemented with a few whiffs of a general anesthetic in operations for ulcer, but this is rarely needed with cancer. The jejunum is drawn up through a hole made in the mesocolon. The segment sutured to the stomach is about 15 cm. from the duodenojejunal angle. If the cut end of the stomach is too long for the slit in the jejunum, the stomach end can be sutured independently for a stretch. The head of the pancreas must be carefully examined, and if it has been denuded or otherwise molested it must be covered with omentum, sutured in place. The patient leaves the bed the fourth or fifth day and the threads are removed the twelfth. Some of the patients have diarrhea. He gives them every day 1 or 2 liters of water containing five lumps of sugar, 1 gm. hydrochloric acid, and the whites of two eggs to the liter. The stomach reduced to one third of its former size functionates like a normal stomach. This method permits removal of two thirds of the stomach by a simple and remarkably rapid technic. Before attempting the operation he has the teeth put in order and systematically cleaned before and afterward, painting the gums with iodin. During the week before and after the patient drinks nothing that is not sterile and taken from sterile vessels.

Correspondenz-Blatt für Schweizer Aerste, Basel

August 12, XLVI, No. 33, pp. 1025-1056

33 *Recent Research on the Cornea and Retina. (Neue Beobachtungen an Hornhaut und Netzhaut des Auges.) O. Haab.—p. 1025.
34 Physicotherapy in Military Circles. (Die physikalischen Heilmethoden in unserm Armeesanitätsdienst.) Haslebacher.—p. 1033.
35 Types of Field Latrines Now in Use. (Hygiène militaire. Les latrines de campagne.) F. Messerli.—p. 1038.

33. **Subsidence of Keratitis Under Tuberculin.**—Haab calls attention to a form of keratitis which he has named *Buchstaben-*, "letter," keratitis. He has encountered only seven cases of it in the course of eighteen years. Its detection requires illumination from the side, with an exceptionally powerful light, such as a Nernst or Osram light. The surface of the cornea shows certain linear irregularities, the epithelium projecting a trifle to form short lines which, as they meet and cross, form figures resembling the straight line letters, A. W. V or X. Small round infiltrations may be scattered along the lines, and there may be some irritation of the eye. The keratitis may subside in from one to three weeks but in some cases it returns again and again. It may entail reduction of the intra-ocular pressure or even loss of vision from the changes in the depths and on the surface. In one such case a woman of 25 had lost the use of the left eye from years of the keratitis, with permanent opacity of the cornea. She had been under specialist treatment for years without avail. The right eye finally became involved. No treatment seemed to have any power to arrest the slow progress of the affection until, after nine months, as a last resort, a course of tuberculin treatment was commenced, and at one stroke the trouble was checked. The inflammation subsided, the cornea became smooth and vision improved from $\frac{5}{60}$ to $\frac{1}{3}$ in less than two months and finally became $\frac{5}{6}$. In the course of three months twenty-four injections of tuberculin had been given, and there can be no doubt that this saved the eye which was slowly going the way of its mate, in which vision had long been only $\frac{1}{10}$. He has had no opportunity to try tuberculin in any other case of the kind. See following abstract.

33. **Recent Research on the Retina.**—Haab declares that the red color of the fundus is not due to the blood, as generally assumed, but to pigmented epithelium back of the retina. The red of the fundus does not give the hemoglobin line in the spectroscope, and in a case of lipemia—the blood nearly white—the fundus showed its normal red color but the finer capillaries in the retina were quite white. He comments further on the peculiar vulnerability of the macula lutea, the tiny yellow spot on which we depend to gain our daily bread. Any slight trauma is liable to injure it, even cause production of a hole in it. Any metal foreign body in the vitreous body or sudden compression may set up an isolated disturbance of the fovea alone. It seems probable that the great demands made physiologically on the fovea may wear it out prematurely. The foveal reflex—the transverse oval shape—occurs only when the macula and its environment are sound, and hence is an index of the condition of the macula. With atrophy of the optic nerve, the foveal reflex enlarges, showing that the fovea has become flatter. With myopia, the premature disappearance of the central reflex is the first symptom of pathologic conditions in the macula, and calls for treatment at once. Linear reflexes may be observed with optic neuritis or other affections involving the macula. These linear reflexes occur radial to the center of the fovea, leaving the center free, and may form a halo around the macula. They are always of pathologic import. Sometimes they are due to edematous swelling of the retina, throwing it into folds, or the folds may be in the hyaloid membrane. The preceding abstract is from the first half of Haab's article.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 13, XXXVII, No. 65, pp. 1009-1024

36 Clinical Importance of Mixed Infection in Diphtheria. F. Lanzarini.—p. 1010.

Policlinico, Rome

August 13, XXIII, No. 33, pp. 993-1018

37 Physical Measures in Treatment of Accidents and War Wounds. (La terapia fisica nella traumatologia e nella medicina in guerra.) R. Pinali.—p. 999.

38 *Heliotherapy for the Wounded. (L'elioterapia rigeneratrice delle forze.) A. Maffi.—p. 1001.

39 Albuminuria and Life Insurance. I. Romanelli.—p. 1003.

Medical Section No. 8, pp. 281-312

40 *Pernicious Anemia; Four Cases. A. Roccavilla.—p. 281.

41 *A Subacute and a Chronic Case of Leukemia. (Leucemia subacuta mieloide a piccole cellule linfocitoidi. Leucemia cronica mieloide a sindrome tifoidea.) A. Bolaffi.—p. 294.

38. **Heliotherapy for the Wounded.**—Maffi has been making a special study of the effect of sunlight as a means of treating bone and joint tuberculosis and other lesions, and has obtained most excellent results in the last two years. In one case of leg ulcer with huge elephantiasis of the leg below, the ulcer of twenty years' duration, rebellious to all measures, systematic heliotherapy healed the lesion in two weeks, and with the aid of Thiersch flaps the ulcer was completely cured by the end of the month. Extreme and individual care is necessary in the tuberculous cases on account of danger of overflooding the organism with the toxin set free, but in all other cases the method can be applied with confidence without special care. It had been his intention to make a special study of heliotherapy on transatlantic liners, but the war interfered with these plans. The exhausted, sick and wounded soldiers returning from the front benefit immensely from a course of heliotherapy, exposing the front one day and the back the next, gradually increasing the exposures. The men bask in the sunlight with enjoyment, and thrive much better than those not taking the heliotherapy.

40. **Pernicious Anemia.**—Roccavilla reports in minute detail four cases of pernicious anemia in men of from 50 to 65, death occurring in four or five months after the increasing weakness had first attracted attention. In one a syphilitic origin was probable.

41. **Leukemia.**—In the first of the two cases described, the patient was a lad of 15 and the white corpuscles were almost exclusively of the immature forms. The blood-producing organs showed histologic changes at necropsy after five months' course of the disease. The spleen and liver were much enlarged and Bolaffi cultivated the *Streptococcus conglomeratus* from the blood. The case was distinguished by its long duration and by the absence of any lesions on the mucosa. The bone marrow showed myeloid metaplasia and there was micromyeloblastic proliferation. The other patient was a previously robust man of 41 who developed suddenly extreme prostration with fever, dying the fortieth day after presenting diarrhea, the spleen and liver progressively enlarging, the blood showing myelocyte leukemia.

Brasil-Medico, Rio de Janeiro

July 29, XXX, No. 31, pp. 241-248

42 Cotton Hygrometer. (Sobre um novo hygrometro.) A. Godoy.—p. 242.

Russkiy Vrach, Petrograd

XV, No. 23, pp. 529-552

43 *Dietetic Treatment of Gastric Ulcer. (O dietitcheskom lietchenii krugloi yazvi zheludka.) A. I. Yarotzky.—p. 529.

44 Operative Technic in Region of Subclavian Vessels. (V oblasti podkliutchitchnikh sosudov.) N. A. Dobrovolskaia.—p. 537.

45 Organization of Aid for Maimed Soldiers. S. A. Brushtein.—p. 539.

46 Action of Guanidin and Methylguanidin on Blood Vessels and Circulation. (Vliyanie methylovikh proizvodnikh guanidina na kroveobrashtshenie.)—p. 544; (O sosudosuzhivaiushtshem dieistvie guanidina i ego methylovikh proizvodnikh.) M. P. Bovshik and E. I. Sinelnikoff.—p. 546.

47 *Research on the Periodical Activity of the Gastro-Intestinal Tract Under Various Conditions. (Niekotoriya noviya danniya o vliyanii razlichnikh uslovii na periodicheskuiu dieyatelnost pishtshevaritelnago pribora.) A. I. Nikulin.—p. 574.

No. 24, pp. 553-576

48 Independent Automatic Irregular Contractions of the Blood Vessels, Studied on Rabbit's Ear. (O samostoyatelnikh sokrashtsheniyakh sosudov.) N. P. Kravkoff.—p. 553.

49 Ultimate Disability from Poisoning with Asphyxiating Gases; Five Cases. A. S. Solovtzova.—p. 565.

50 Device to Aid in Holding Dressings in the Shoulder Region. A. T. Berdiaeff.—p. 567.

43. **Treatment of Gastric Ulcer.**—Yarotzky describes in detail his method of treatment of gastric ulcer, which is exclusively dietetic. When the patient enters the hospital he gets the next morning, even in the presence of hemorrhage, one raw white of an egg, without salt, and in the evening of the same day 20 gm. of fresh butter, also without salt. Each succeeding day the amount of the whites of eggs is increased by one, and that of butter by 20 gm., until eight whites and 160 gm. of butter are given. The latter amount may be con-

tinued for one or two days, and then mashed potatoes may be added, prepared with water and butter. Any oil, of good quality, may be given instead of the butter. No water is allowed, as this increases the flow of gastric juice. Water may be given in the form of enemas if the thirst is excessive. Later on, weak sweetened tea is allowed. Milk is not given for a long time, but vegetables and various gruels with oil or butter are well borne. This diet Yarotzky found ensures the greatest rest for the stomach, relieves the pain, the belching, the burning and the inflation of the epigastric region, and causes contraction of the cavity of the stomach. This helps to bring the edges of the ulcer together and promotes healing. The gastric acidity with this treatment is greatly reduced. It was found useful also in cases of poisoning with caustic acids and alkalies threatening perforation, also in cases of hyperchlorhydria and gastrosuccorrhea when it is necessary to keep the stomach at rest, and in the after-treatment of operations on the stomach. Yarotzky gives the details of fifteen cases to illustrate the advantages of this dietetic method.

47. **Periodical Activity of the Gastro-Intestinal Tract.**—Boldireff and Nikulin of the pharmacologic laboratory of the University of Kazan have been conducting extensive research on the periodical activity of the gastro-intestinal tract during and outside of digestion. An article by Nikulin on the subject was summarized in THE JOURNAL, Oct. 9, 1915, p. 1316. He here reports further research in this line to determine which factors promote and which inhibit this periodical activity. He made sixty-eight experiments on two dogs with permanent fistulas into the stomach and duodenum. The substances that check the periodical activity of the gastro-intestinal tract may be classified as true and accidental inhibitors. Pain, heating the animal, introduction of very hot or cold fluids into the gastro-intestinal tract, in amounts not less than 60 c.c., and acids in a certain concentration, all have a decided effect in checking the periodical activity of the tract, as true inhibitors. The accidental inhibitors include indifferent substances such as water, liquid petrolatum, white of egg. The work of the digestive tract is checked by the true inhibitors at any stage of its activity, and the inhibition occurs more readily and promptly if the stomach or bowels are in a pathologic catarrhal condition. During experiments on the gastro-intestinal tract, the reaction of the stomach content should be alkaline, as acids may modify the periodical activity of the stomach, and thus mistaken conclusions may be drawn. Nikulin thinks that this is responsible for Carlson's recent statement that water, tea, coffee and bitters are true and constant inhibitors.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

August 12, II, No. 7, pp. 521-592

51 *Multiple Small Attacks as Rudimentary Form of Epilepsy. (Drie opstellen over epilepsie. II. De pathogenese der veelvuldige, kleine aanvalletjes.) G. C. Bolten.—p. 527.
52 *Vaccine Therapy in Typhoid. J. L. A. Peutz.—p. 555.
53 *To Improve Appearance of Thick Lenses in Eyeglasses. (Een cosmetische verbetering van den vorm der sterke negative brilleglazen.) W. Koster.—p. 568.

51. **Multiple Slight Attacks Suggesting Epilepsy.**—Bolten discusses Friedmann's and others' statements in regard to multiple slight "absences" of which he has encountered a number of cases. He disagrees with those who regard them as a morbid entity or as identical with Gelineau's "narcolepsy," declaring that the multiple small attacks do not form a sharply circumscribed clinical-morphologic picture but vary within wide limits. They may be merely the simplest form of disturbance of consciousness ("absence") or merely a slight sensation of dizziness or the most elementary motor response to irritation (rolling the eyes), or they may be of a complex character, with actual though rudimentary "motor discharges" of the most varied nature. The different cases have only the one feature in common that these small attacks occur repeatedly and often and that each is very brief. From the clinical standpoint they must be regarded as the most rudimentary form of the epileptic seizure. They differ from it only in degree and quantitatively. The pathogenesis also differs in the various cases. A small proportion of the cases belong to hysteria; the largest proportion are of the cerebral epilepsy type, while there can be no doubt that "true" epilepsy is responsible for others. They have nothing to do with narcolepsy nor with what Bratz calls *Affect-Epilepsie*, and they cannot be regarded as a separate morbid entity either from the standpoint of a neurosis or of anatomy. Fourteen cases are described from Bolten's own experience, grouped according to the above scheme of the pathogenesis. He meets the objection that the mind shows no impairment with these multiple brief attacks, even through many years, by citing some cases of men and women with severe epileptic seizures who were yet able to conduct a more or less important business for from twenty to forty-seven years after they began to have the severe true epileptic seizures at the age of about 20, and with no signs of mental impairment at any time since.

Bolten's most typical case exhibiting the multiple, small attacklets, as he calls them, was in an intelligent and placid young woman of 18, absolutely free from signs of hysteria or emotionalism, one of eight healthy children. Without known cause, at the age of 6, she began to have these attacks, averaging from eight to twenty a day but sometimes many more. They were always of the same character: She does not stop what she is doing; if she was running, she keeps on running, but she grows pale and stares at vacancy; the cornea and pupil reflexes are abolished during the attack, but she never falls or bites her tongue or passes urine or drops anything from her hands during the brief attack. If she is playing the piano, her fingers keep on touching the keys but the discord shows that something is the matter. Sometimes merely her nonreplying to a question is the only thing that attracts attention to the fleeting attack. Nothing seems to influence the coming on or warding off of the attacks, and no shaking, calling to her or pulling on her has ever had the slightest influence in shortening or interrupting an attack, and no treatment for hysteria, epilepsy or anything else has ever shown any influence, which, Bolten remarks, excludes "true" epilepsy. The attacks are precisely the same now as when he made a careful study of the case four years ago. Otherwise the young woman seems mentally and physically sound, rather above the average.

52. **Vaccine Therapy of Typhoid.**—Peutz concludes his report of his experiences with vaccine therapy in eleven cases of typhoid with the quotation from Deutsch: *Wir müssen den günstigen therapeutischen Angaben mehr als skeptisch gegenüberstehen.* "We must be more than skeptical in accepting favorable reports of therapeutic action." He says that in his eleven cases the results of vaccine therapy were but little more than nothing (*weinig meer dan niets*).

53. **Improved Shape for Negative Eyeglasses.**—Koster suggests that the extreme edge of the thick lenses required for strongly negative glasses might be made to taper instead of showing the broad and unsightly edge. It would make no difference in the use of the glasses, except in looking far to the side, if the edge, beyond the visual expanse was ground to taper to a sharp edge all around. This would immensely improve the appearance of the glasses.

Finska Läkaresällskapets Handlingar, Helsingfors

LVIII, No. 5, pp. 719-882

54 *Interpretation of Findings on Direct Visual Inspection of Interior of Thorax and Abdomen. (Bidrag till kännedomen om laparo- och torakoskopi.) A. Johnsson.—p. 719.
55 *Aneurysm of the Aorta; Study of Thirty-Four Cases. J. C. Sjöblom.—p. 749.
56 *Epidemic of Typhoid in Finnish City. (Tarmtyphusepidemien i Tammerfors 1916.) M. Björksten and C. Nyberg.—p. 808.

No. 6, pp. 883-1056

57 *Predisposing Factors in Appendicitis. (Till kännedomen om appendicitens förekomst samt något om de disponerande momenten i appendicitens etiologi.) W. Backman.—p. 883.
58 *Congenital Rhabdomyoma of the Heart. E. H. Jägerskiöld.—p. 953.
59 *Chronic Indurative Pancreatitis; Two Cases. F. Stenius.—p. 966.
60 Treatment of War Wounds of the Femur; Sixty-Four Cases. (Krigskirurgiska erfarenheter om behandlingen af skottskador å femur.) A. F. Hornborg.—p. 976.

54. **Laparoscopy and Thoracoscopy.**—Johnsson has been applying the cystoscope in investigation of the interior of the

abdomen and thorax, and describes the findings in twelve abdominal and eight thorax cases. The technic is simple, but interpretation of the findings is not so easy. It is a valuable aid in diagnosis in dubious cases. He reproduces some of the views thus obtained; one shows scattered hemorrhages of different ages scattered over the costal pleura after removal of a cancer of the spine in a woman of 35. The pleural trouble was evidently part of the metastasis picture.

55. **Aneurysm of the Aorta.**—Sjöblom found a history of syphilis in over 77 per cent. of 34 cases of aortic aneurysm at the Helsingfors hospital since 1900. In the 10 tested for the Wassermann reaction, it was positive in 90 per cent. The shortest interval since infection was seven years, the longest 35. The youngest patient was 30 at the time of his death, the oldest 70. In 9 cases rupture of the aneurysm was the cause of death, and in 13, interference with the action of the heart. In all but 2 cases the aneurysm was in the thoracic aorta; one patient had an aneurysm in both this and the abdominal aorta. In one case there was pronounced acute nephritis, but 7 presented albuminuria. Under antisyphilitic measures subjective improvement for a longer or shorter time was realized; 3 of the 13 are now clinically sound with unimpaired earning capacity during the year to date. By an early diagnosis and prompt treatment it may prove possible to arrest the aneurysm in its incipiency. It is liable to be accompanied by symptoms of cardiac insufficiency or angina pectoris, or there may be merely neuralgiform pains, cough with or without blood in the sputum, or symptoms from the pressure in the mediastinum. The physical symptoms may not appear until late in the course of the aneurysm, and the diagnosis may depend almost altogether on the Roentgen picture. A serous effusion in the pleura is a common complication, and is liable to mask the aneurysm. Puncture of the effusion in such a case might be dangerous as it might open the aneurysm. Although the pains and other disturbances may subside completely under antisyphilitic treatment, yet there is little chance of the aneurysm retrogressing.

56. **Typhoid at Tammerfors.**—From forty-one cases in January the epidemic jumped to 1,609 cases in March. The water supply had been accidentally contaminated by dredging near the mouth of the intake pipes. The epidemic was combated by providing quarters in the hospitals to receive all typhoid patients—which was by no means an easy task at first—and by getting ample nursing and disinfecting service for which the city appropriated ample funds from the start. The water contained numerous typhoid bacilli and it was at once chlorinated, after which the epidemic died out although occasionally a few typhoid bacilli are still found in the water. The chlorination can thus be regarded as quite satisfactory, but not as an absolute guarantee against typhoid bacilli.

57. **Appendicitis in Finland.**—Backman analyzes 946 operative appendicitis cases in the last five years in a district with 104,198 inhabitants. The proportion was thus 1.28 per thousand. Only 29.4 per cent. of the total cases were of the destructive type, and in 21.6 per cent. of this group a familial predisposition was manifest. A nervous or tuberculous taint was evident in 50 per cent. and only 8.4 per cent. of all the appendicitis patients could be classed as robust. Dyspepsia had been noted in 51.6 per cent. of the destructive and in 58.8 per cent. of the catarrhal cases. Gastroptosis was found in 34.7 per cent. of the severe cases in men and in 79.7 per cent. in the women; in the catarrhal cases, in 55.2 per cent. of the men and 77.7 per cent. of the women. These figures indicate a constitutional factor as an element in the etiology of appendicitis. The well-to-do are affected more than the working classes. Chronic constipation has a share in its development, but no connection with acute enteritis or colitis was evident, and no influence from acute infectious disease or the seasons. In 727 cases the appendix varied in length from 2 to 19 cm.

58. **Rhabdomyoma of the Heart.**—The case described by Jägerskiöld was in an infant of 7½ months who had developed apparently normally except for striking pallor. There was no cyanosis, no restlessness, merely a slight cough for a few days, and the boy died silently in bed one night. The case resembles in every respect Seiffert's case, and sustains his views as to the origin of the growth from giant embryonal heart muscle cells. Nothing abnormal was found in the brain or kidney.

59. **Chronic Pancreatitis.**—Stenius found that a cancer had obstructed the outlet to the pancreas in each of the two cases of indurative pancreatitis he describes. The women were 64 and 50, and this obstruction amply explains the pancreas trouble although some local infection had probably accelerated it.

Norsk Magazin for Lægevidenskaben, Christiania

August, LXXVII, No. 8, pp. 989-1124

61 *Roentgenography in the Diagnosis of Suppuration in the Accessory Nasal Sinuses. (Röntgenogrammets betydning for diagnosen av nasebihulernes empyemer.) R. Gording.—p. 989.

62 *Scorbutus and Its Prophylaxis. (Fortsatte undersøkelser om skjørbuk med specielt sigte paa at konservere hvitkaal med bibehold av dens antiskorbutiske egenskaper.) A. Holst and T. Frølich.—p. 1008.

63 *Thymus Treatment of Chorea. (Corea minor. Aetiologie og patogenese.) A. O. Haneborg.—p. 1043.

61. **Roentgenography of the Accessory Nasal Sinuses.**—Gording's study of this subject is illustrated with twenty-one roentgenograms of healthy and diseased sinuses, and of sinuses in the cadaver. Roentgenography as an aid to the diagnosis is of most import with frontal sinusitis and in the discovery of involvement of more than one sinus. It is also valuable in revealing asymmetry in the sinuses, which may otherwise prove misleading. The sphenoidal sinus is the only one that is not shown up by sagittal roentgenography. Even the picture from the side is not reliable, as the shadows of the two cavities are superposed and blend. When there are septa, and the front wall is thick, the shadow may be dark even with a healthy sinus.

62. **Further Research on Scorbutus.**—Holst and Frølich reiterate that scorbutus in young children and in adults is the same affection, the difference being merely that the bones are complete in adults and hence do not show the changes observed in infants. They have induced scorbutus in guinea-pigs and in monkeys, the clinical picture including even hemorrhage in the kidney, exophthalmos and microscopic changes in the bones. They have also cured the disease in the animals by giving the same antiscorbutic food that cures it in man. The research they here report was undertaken to discover some means of preserving the essential elements in the antiscorbutic articles of food, so that they could be taken on long voyages, etc., where there is danger of scorbutus. They dried white cabbage so that it kept for two years all its antiscorbutic properties as tested on experimental animals. It also retained approximately its color and taste. The drying process was done at a temperature of only 37 C. A dish of phosphorus pentoxid was placed in the air-tight exsiccator with the cabbage. The dish of the pentoxid was changed for a fresh dish now and then, as the weeks passed, until it ceased liquefying. This was the sign that the cabbage was thoroughly desiccated even at the temperature of 37 C. (98.6 F.).

63. **Chorea Minor.**—Haneborg gives the details of sixty-nine cases of chorea, and then discusses the views of various writers as to its etiology. He says further the hysteric form is rare and is accompanied by other signs of hysteria, and it often occurs from imitation. One feature peculiar to chorea minor is that it begins exclusively in children. Adults can develop acute rheumatism, but never chorea. The chorea age, Haneborg emphasizes, is from 2 to 16, and this age is the period of the thymus gland. Is it not possible, he suggests, that chorea may be the result of deficient or perverted functioning of the thymus gland? Does the thymus gland contain substances which have a tranquilizing influence on the nervous system, so that any deficiency in its internal secretion may leave the nervous system in the young free to behave abnormally? The adult nervous system has acquired a stable balance so that it does not suffer from lack of thymus functioning.

It seems plausible to assume that with acute articular rheumatism or any other acute infectious disease the thymus may suffer. It need not inevitably suffer but, if it does, its secreting function may be impaired and the unstable nervous system of the child may feel the lack of the normal restraining influence from the thymus. The nervous system is thus left free for exaggerated reflex irritability, and we have the clinical picture of chorea. Thymus extract seems to have a sedative influence on the nervous system. Vetlesen has been giving it systematically to patients with exophthalmic goiter, finding it decidedly beneficial, and Haneborg has given it with good effect to control convulsions. He mentions the case of a congenital idiot who had had for years from fifteen to thirty convulsions a day, rebellious to all measures, until they subsided under a course of thymus treatment. They returned later, but milder, and only one or two a day. After a second successful case of convulsions subsiding under thymus treatment, Haneborg began to treat chorea with thymus, and the clinical histories here reported show the abrupt turn for the better when this was done. Sixteen hospital patients were given the thymus treatment and several in his private practice. The results were most satisfactory, both in the infectious and in the hysteric form of chorea, even in cases of many months' standing. The choreic movements returned in one case when the treatment was suspended after a week, but subsided anew when it was resumed.

His idea is that the thymus is not the only factor involved in the production of chorea, but that an insufficiency in the functioning of this gland may be the drop that makes the cup spill over—upsetting the unstable balance of the immature nervous system, and allowing the play of uncoordinated, choreic movements. There is much to sustain the assumption that an infection is the primary factor, an infectious encephalitis. But this alone does not bring on chorea, as otherwise chorea might occur in adults. The additional factor which imprints the chorea stamp on the clinical picture is thymus insufficiency, and thymus treatment may do away with this factor. He advises the salicylates at first for two days if there are rheumatic pains and fever; otherwise not. At the same time he gives from three to six thymus tablets daily—a child of 10 getting four or five a day. He suspends the thymus treatment when the jerking movements have ceased.

In two cases of pregnancy chorea, the jerking movements subsided under thymus, without other measures, as he expected, but in two cases of tic convulsif, a purely nervous affection, no effect was apparent.

Ugeskrift for Læger, Copenhagen

August 10, LXXVIII, No. 32, pp. 1353-1396

64 *Pandy's Test for Albumin Reaction in Cerebrospinal Fluid. (Om Pandy's Reaktion i Cerebrospinalvædsken.) C. With.—p. 1353.
65 *Lumbar Puncture in Syphilis. (Om Generne ved samt om Indikationerne for Lumbalpunktur ved Syphilis.) C. With.—p. 1353.
66 *Congenital Syphilis at Copenhagen General Hospital. Ehlers.—p. 1370.

64. **Test for Albumin in Cerebrospinal Fluid.**—With has been applying Pandy's test with parallel tests according to the Bisgaard, Ross and Jones method in 225 clinical cases. He tabulates the findings in the cases of syphilis, comparing them with the cell count and the Wassermann reaction. Pandy's reagent is a concentrated solution of liquid phenol in distilled water. About 80 c.c. of the liquid phenol are mixed with the distilled water, stirred and placed in the incubator for several hours. After keeping for a few days at room temperature, the upper, watery part is used for the reagent. A drop of the cerebrospinal fluid is transferred with a Pasteur pipet to the bottom of a watch glass filled with the reagent. If no precipitate is thrown down in five seconds, the findings are negative. Pandy reported negative findings in all but 5 of 133 patients free from paresis, and these 5 had a history of syphilis. In 106 cases of paretic dementia the reaction was very pronounced and there was a weak response in 7, and no response in 9. With concludes from his study of the reaction in 325 cases that an absolutely negative reaction is strong testimony in favor of normal conditions while a very pronounced reaction testifies the opposite. As the technic is so extremely simple and as the findings are complete in a few seconds, he thinks the test will find useful application at the bedside, accepting the absolutely negative or the strongly positive responses as a criterion, not trusting to the less decided responses. A strong positive response calls for the application of other, more exact tests, while an absolutely negative reaction is a fairly certain sign that the fluid is normal.

65. **Lumbar Puncture.**—With has had opportunity to study the effects of lumbar puncture on large numbers of patients, and tabulates the outcome, listing the symptoms which followed the puncture when only 5 c.c. were withdrawn and in the cases in which the lumbar puncture was repeated two or more times. The cases are classified further as the puncture was done in the hospital or on outpatients. He insists on a week's rest afterward if the patient cannot be induced to enter the hospital, and warns that a brain or spinal cord tumor in a syphilitic need not necessarily be of syphilitic origin, relating a few cases. In 453 cases of syphilis apparently not involving the nervous system, 56 of the men and 74 of the women had severe headache and vomiting for a few days to a week, after the lumbar puncture. With remarks in conclusion that although he has had no experience of the kind and has not encountered any altogether reliable account on record, yet it seems plausible to assume that the fluctuations in the pressure in the spinal fluid after lumbar puncture might spread a previously localized process. Holm has reported a case which suggests this: A child with symptoms of a tumor in the brain developed symptoms of meningitis five days after lumbar puncture, and necropsy revealed a tubercle in the brain and tuberculous meningitis.

With recapitulates his experiences with lumbar puncture done 490 times on patients without signs of nervous disease that more or less serious by-effects followed in 28 per cent. The by-effects were more numerous and more severe the larger the amount of fluid withdrawn and when the puncture was done on outpatients. With patients presenting symptoms of involvement of the nervous system, the by-effects were less pronounced, but were often severe in the neurasthenic. He insists that lumbar puncture should not be done the same day as the injection of salvarsan. At the same time he emphasizes the necessity for lumbar puncture in all cases of syphilis in the hospital when it has not been done before. A negative response to tests of the cerebrospinal fluid is no guarantee that the nervous system is not involved. When an old syphilitic with no symptoms left but a positive Wassermann reaction is in the hospital for any reason, he urges not to miss the opportunity of getting an oversight of the case from all sides.

66. **Congenital Syphilis.**—Ehlers has been keeping for years a general register of all cases of syphilis that have passed through his hands at the public hospital. He has found it of great use in determining the age of the syphilis when the patients return later, and in determining the share of syphilis in nervous affections, cardiovascular disease, etc. This general register now includes all the adult patients as far back as 1887 and the children to 1863. It includes not only all the children with congenital but also those who have acquired syphilis, as the fifty-three years of experience have shown that the two may be superposed and blend into a clinical picture which is illuminated by the facts gleaned from the general register. His register is on the card catalog system, each case being recorded with the full name, place and exact date of birth, the diagnosis and the time of treatment. Sooner or later, he says, the old prejudice against full statistics of syphilis, as a "disgraceful disease," will be overcome and it will be managed like other acute and chronic infections to permit adequate prophylaxis. During the period he mentions there were 1,622 children with congenital syphilis, of whom 591 died. The mortality has declined somewhat; the highest figure was 53 per cent. in 1871-1880 while since 1900 it has been 32 and 34 per cent. He adds that those who died were in a very grave condition, practically moribund, when brought in. The treatment of children with congenital syphilis, when given a chance, is by no means the ungrateful task which many physicians think or as these statistics seem to show.